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**HYDROLOGIC DATA  
FOR  
EXPERIMENTAL AGRICULTURAL  
WATERSHEDS IN THE  
UNITED STATES  
1956-59**

**Miscellaneous Publication No. 945**

**Agricultural Research Service  
U. S. DEPARTMENT OF AGRICULTURE  
In Cooperation With  
State Agricultural Experiment Stations**



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**Hydrologic Data  
for  
Experimental Agricultural Watersheds  
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1956-59**

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Miscellaneous Publication No. 945

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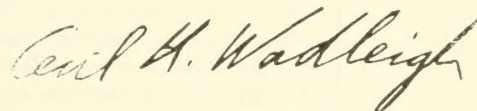




## FOREWORD

This publication presents basic data on monthly precipitation and runoff; annual maximum discharges and volumes of runoff; and selected runoff events with associated data on rainfall, land use, and antecedent conditions for agricultural watersheds where research studies were in progress in the period 1956-59. Its presentation is a continuation of the activity of processing and releasing hydrologic data of general interest gathered cooperatively with other agencies. Throughout the life of the watershed studies the State agricultural experiment stations have collaborated in the selection, planning, and operation of the research studies. In several cases, the U.S. Geological Survey and State and local agencies, such as State water boards and highway departments or local drainage and conservation districts, have assisted in the work. The Soil Conservation Service has carried out most of the field surveys upon which the classification and correlation of soils and evaluation of other watershed characteristics in the descriptions have been based.

The data included here are primarily in response to a request by the Soil Conservation Service, but the information will also be useful to other governmental agencies, private engineers, and others concerned with the development and conservation of the Nation's water resources.



Director, Soil and Water Conservation  
Research Division

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The decimal system of paging is used to index the watershed data. Pages are numbered at the bottom according to location and watershed number, and the data for each watershed are given on one or more pages. For example, page 5.6-2 is location 5 (College Park, Md.), watershed 6 (W-6 at College Park), and page 2 of the data for that watershed.

In table 1, page 8, discontinued watersheds are listed by State, locality, number of units, record period, and location number. Table 2, page 9, shows list of continuing or new watersheds by State, locality, watershed units, and assigned location numbers that are reported for 1956-59 in this publication.



## HYDROLOGIC DATA FOR EXPERIMENTAL AGRICULTURAL WATERSHEDS IN THE UNITED STATES, 1956-59

This publication presents selected hydrologic data for the calendar years 1956-59, inclusive. The data include monthly precipitation and runoff for 157 watersheds, annual maximum discharges and annual maximum volumes of runoff for 142 of the watersheds for time-intervals of 1, 2, 6, and 12 hours and for 1, 2, and 8 days, and detailed information for one or more selected typical storm events for 134 of them. Page numbers for older watersheds at the various locations are the same as those given in three previous publications (see next section), so that old records and general descriptions can be readily consulted. New watersheds—the 45 not included in the previous publications—were generally assigned higher location numbers.

Information on selected storm events includes (1) tabular data for the 30-day antecedent rainfall and runoff prior to the events; and, for the storms, (2) data on rainfall and runoff intensity or rate and on accumulated depths of rainfall and runoff, (3) description of watershed conditions at the time of the selected events, (4) graphs of hydrographs and rainfall histograms, (5) watershed maps, and (6), for some of the larger drainage areas, isohyetal maps of storm rainfall distribution.

For newly established watersheds, descriptions of watershed physical characteristics, instrumentation, graphs, maps, land management, and recommended area of application of the results are also given.

### PUBLICATIONS OF EARLIER DATA

Hydrologic data for past years on many of the currently operating experimental agricultural watersheds have been previously summarized in three looseleaf publications by the Agricultural Research Service of the U.S. Department of Agriculture. These reports are listed and summarized below as references 1, 2, and 3 to simplify citations to them in this publication:

**Reference 1.**—MONTHLY PRECIPITATION AND RUNOFF FOR SMALL AGRICULTURAL WATERSHEDS IN THE UNITED STATES. Soil and Water Conservation Research Branch, 691 pp. June 1957. (Includes physical descriptions and land use of 334 experimental agricultural watersheds at 60 locations in 27 States for the period 1923-

57. Many of these watersheds had been discontinued prior to 1955.)

**Reference 2.**—ANNUAL MAXIMUM FLOWS FROM SMALL AGRICULTURAL WATERSHEDS IN THE UNITED STATES. Soil and Water Conservation Research Division, 330 pp. June 1958. (Includes records from 322 watersheds at 59 locations in 27 States for the period 1923-57. Many of these watersheds had been discontinued prior to 1958.)

**Reference 3.**—SELECTED RUNOFF EVENTS FOR SMALL AGRICULTURAL WATERSHEDS IN THE UNITED STATES. Soil and Water Conservation Research Division, 374 pp. January 1960. (Includes a sampling of one to six typical runoff events from 68 watersheds at 40 locations in 25 States for the period 1933-59. The publication presents maps of each watershed, watershed conditions for each event, including the 30-day antecedent rainfall and runoff, and tabular as well as graphical data on each storm.)

The above three publications have been furnished to the Soil Conservation Service and to other governmental agencies—Federal, State, and local. They have also been distributed to State agricultural experiment stations, university libraries, and engineering departments, and, when requested, to private engineers and individuals.

### FORM OF DATA PRESENTATION

The data in this volume are presented for each watershed in the following order: (1) watershed description, if not previously published; (2) monthly precipitation and runoff; (3) local monthly normal precipitation, if not previously published; (4) annual maximum flows; (5) tabulations of data for selected runoff events; (6) graphs of selected runoff events; (7) watershed maps, if not previously published or if revised; and (8) isohyetal maps (in some cases) of storm rainfall distribution for selected runoff events.

### CONTINUING WATERSHEDS

Since the descriptions of 112 of the current watersheds have been published in *Reference 1*, the tabular data presentation for them begins at the top of the first page. Above the

border at the left, the month and year of data preparation are given.

In the space to the right of the first table title MONTHLY PRECIPITATION AND RUNOFF (inches), the location *name*, watershed *number* (or designation), and watershed *size* are given. In the table, for each current *calendar year*, the *precipitation* (P) in inches is listed in the monthly columns, with the yearly total given in the last column headed "Year." In the line below, the corresponding *runoff* (Q) in inches is similarly listed for each month and year.

In the second table, entitled ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS, data are also given for the *calendar years* listed in the first column. Under the *maximum discharge* heading, the date column shows the day and month the instantaneous peak rate in inches per hour occurred. In computing the rate, corrections were made for any significant pondage above the runoff-measuring device. Under the *maximum volume* heading, the date refers to the day and month on which the interval began; for example, if the interval began on August 30 at 11:59p, the entry in the date column will be 8-30. The depths for 1 hour to 8 days are the annual maximum values recorded, without regard to even clock hours or days; thus, if the 6-hour interval began at 1:32p, the interval would end exactly 6 hours later at 7:32p. The volume given is in inches of average depth over the watershed for each of the seven selected time-intervals (1, 2, 6, and 12 hours, and 1, 2, and 8 days).

Notes and footnotes of explanation of the data given below the first two tables include (1) a statement on the quality of records based on the following criteria: *excellent* indicates in general that the records are probably accurate within 5 percent, *good* within 10 percent, *fair* within 15 percent, and *poor* that the records may be in error by over 15 percent; (2) a general statement as to watershed conditions and other physical changes for the period covered; (3) corrections for previously reported data; and (4) other pertinent material or explanations of the hydrologic data in the two tables.

The tabular data for *selected runoff events* begin in the remaining space on the first page and then are carried forward on continuation sheets until completed. One to five storm runoff events were chosen, from data available, for presentation. In general, the *selected runoff events* were those in which runoff was produced by a relatively uniform rainfall excess of short duration. The information for each event includes tabulation of (1) *antecedent* daily rainfall and runoff for 30 days before the event, (2) rainfall *intensities* and *accumulated amounts* for the event, (3) runoff *rates* and *accumulated amounts* for the event, and (4)

specific *watershed conditions* at the time of the event. Simple graphs of the rates of rainfall and runoff are shown for all events on pages following the tabular data. Maps follow the graphs unless previously published in *Reference 3* or if they were shown herein on the map of another watershed. Isohyetal maps, if any, generally follow the regular maps.

In the "Notes" space at the bottom of the first page for runoff events, the multiplier to convert runoff rates in inches per hour to cubic feet per second is given, followed by references to maps, if required, and explanatory notes or footnotes relating to the tabular data. Below the bottom border and above the first page number the cooperating agencies are listed. The notes on continuation pages contain the statement on the multiplier and similar explanations of the data on each page.

## NEW WATERSHEDS

For the 45 watersheds installed in recent years that have not been reported previously, the presentation begins with the watershed description in the upper part of the first page. The explanations and definitions upon which the description is based are given in the next section.

The first line, centered at the top of the sheet, gives the *project location*, which is the nearest city or town, and the *number* or *name* of the watershed as used locally. The descriptive material is then given under the 12 major topics listed down the left side of the sheet: *Location, Area, Shape, Slopes, Soils, Erosion, Land Capability, Surface Drainage, Character of Flow, Instrumentation, Watershed Conditions, and Generally Represents*.

After this description, the tabular data are then summarized in the first two tables and notes as previously described for "Continuing Watersheds," except that the local monthly normal precipitation figures, based on the nearest Weather Bureau gage of long record, are given on the last line of the table MONTHLY PRECIPITATION AND RUNOFF (inches). The tabular data for SELECTED RUNOFF EVENTS then commence on the second page of the series for the particular watershed, and the rest of the material follows in the same order as previously indicated.

## WATERSHED DESCRIPTIONS

The following definitions and explanations were used in describing watershed location, watershed characteristics, instrumentation, land management, and recommended area of application of the hydrologic data:

LOCATION gives county and State, distance and direction of the runoff gaging station from the nearest city or town, and the major river



basin in which it lies. When two or more basins are involved, the tributary or subbasin is given first, followed by the major basin.

AREA of watershed is given in acres if under 640 acres, in both acres and square miles (in parentheses) if over one square mile. If areas are revised, additional values are given with notes on date of change.

SHAPE is described in simple terms with overall dimensions in feet or miles, depending on size.

SLOPES are given in terms of the ranges commonly used in soil survey work in the locality. The percentages of the watershed lying in each slope class are listed. As an example, "8% is in 0-2% class" means that 8 percent of the watershed area has slopes ranging from 0 to 2 percent. The "Aspect" refers to the general direction of the slope; a watershed having a southeast (SE) aspect would slope downstream from *northwest to southeast*.

SOILS are described briefly, according to definitions from the U.S. Department of Agriculture SOIL SURVEY MANUAL, Agriculture Handbook 18, published in 1951.

*Soil texture* refers to the relative proportions of the various size groups (or separates) of individual soil grains in a mass of soil. Specifically, it refers to the proportions of clay, silt, and sand below 2 millimeters in diameter. The various classes of texture in order of increasing percentages of the smaller size groups and decreasing percentages of the larger size groups are (1) sands, (2) loamy sands, (3) sandy loams, (4) loam, (5) silt loam, (6) silt, (7) sandy clay loam, (8) clay loam, (9) silty clay loam, (10) sandy clay, (11) silty clay, and (12) clay. In some of the descriptions, the broader classification of coarse, moderately coarse, medium, moderately fine, and fine has been used—the coarse soils are the sands and the fine soils the clays.

*Soil structure* refers to the aggregation of primary soil particles into compound particles, or clusters of primary particles, that are separated from adjoining aggregates by surfaces of weakness. Structure *grade*, or the durability of the aggregates when subjected to disturbance, is described as structureless, weak, moderate, or strong. The *size* of the aggregates is described as very fine, fine, medium, coarse, and very coarse. Structure *shape* is described as being platy, prismatic, columnar, angular blocky, subangular blocky, granular, or crumb.

*Permeability* is the quality of a soil that enables it to transmit water or air. This quality is described by the terms "very slow," "slow," "moderately slow," "moderate," "moderately rapid," "rapid," and "very rapid."

*Internal soil drainage* is the quality of a soil that permits the downward flow of excess water through it. Internal drainage is reflected in the frequency and duration of periods of saturation

with water. It is determined by the texture, structure, and other characteristics of the soil profile and of underlying layers and by the height of the water table, either permanent or perched, in relation to the water added to the soil. Internal soil drainage is described as none, very slow, slow, medium, rapid, and very rapid.

EROSION conditions on the watershed are described in accordance with the classification for water and wind erosion, also briefed from Agriculture Handbook 18. The percentage of the watershed in the following erosion classes is given.

Class 1.—The soil has a few rills or places with thin A horizons that give evidence of accelerated erosion, but not to an extent to alter greatly the thickness and character of the A horizon. Except for soils having very thin A horizons (less than 8 inches), the surface soil consists entirely of A horizon throughout nearly all of the delineated areas. Up to about 25 percent of the original A horizon, or original plowed layer in soils with thin A horizons, has been removed from most of the area. This class also includes the areas of no erosion.

Class 2.—The soil has been eroded to the extent that ordinary tillage implements reach through the remaining A horizon or well below the depth of the original plowed layer in soils with thin A horizons. Generally, the plow layer consists of a mixture of the original A horizon and the underlying horizons. Mapped areas of eroded soil usually have patches in which the plow layer consists wholly of the original A horizon and others in which it consists wholly of underlying horizons. Shallow gullies may be present. Approximately 25 to 75 percent of the original A horizon or surface soil may have been lost from most of the area.

Class 3.—The soil has been eroded to the extent that all or practically all of the original surface soil, or A horizon, has been removed. The plow layer consists essentially of materials from the B or other underlying horizons. Patches in which the plow layer is a mixture of the original A horizon and the B horizon or other underlying horizons may be included within mapped areas. Shallow gullies, or a few deep ones, are common in some soil types. More than about 75 percent of the original surface soil, or A horizon, and commonly part or all of the B horizon or other underlying horizons has been lost from most of the area.

Class 4.—The land has been eroded until it has an intricate pattern of moderately deep or deep gullies. Soil profiles have been destroyed except in small areas between the gullies. Such land is not useful for crops in its present condition. Reclamation for crop production or for improved pasture is difficult but may be practicable if other characteristics of the soil are favorable and erosion can be controlled.

Class +5.—Recent alluvial and colluvial deposition.

LAND CAPABILITY is given as classified by Klingebiel and Montgomery in U.S. Department of Agriculture LAND-CAPABILITY CLASSIFICATION, Agriculture Handbook 210, published in 1961. The classification expresses the suitability of land for use without deterioration. The eight land-capability classes are distinguished according to the risk of land damage or difficulty of land use. The following classes I to IV are suitable for cultivation and other uses, whereas classes V to VIII are not suitable for cultivation.

Class I.—Very good land for cultivation; nearly level and productive; not subject to erosion; needs only ordinary good farming methods.

Class II.—Good land for cultivation; mostly gently sloping, not more than moderately subject to erosion; some land may be rather wet; can be farmed safely with easily applied practices.

Class III.—Moderately good land for cultivation; mostly moderately sloping; some areas too wet or too dry; can be farmed safely with practical conservation measures, carefully applied; usually a combination of two or more measures is needed.

Class IV.—Fairly good land, suitable for occasional cultivation; generally strongly sloping; often shallow or very sandy; often found in dry climate.

Class V.—Land very well suited for grazing or forestry; requires good range or woodland management.

Class VI.—Land well suited for grazing or forestry; steeply sloping land, stony or shallow soil, eroded land, droughty land, or wet land; requires careful management.

Class VII.—Land fairly well suited for grazing or forestry; severely limited in use by such factors as very steep slope, shallow or droughty soil, wetness, severe erosion, or excessive salinity; requires very careful management.

Class VIII.—Land not suitable for cultivation, grazing, or forestry; may be useful for wildlife, recreation, or protection of water supplies.

SURFACE DRAINAGE refers to the ease with which excess water flows from the watershed area. The length of principal waterway is the distance from the gaging station to the most remote point on the watershed boundary, measured along the flood plain of the watercourse.

CHARACTER OF FLOW describes the flow of the principal watercourse with respect to permanence and space. The following definitions are from Meinzer's OUTLINE OF GROUND-WATER HYDROLOGY, U.S. Geological Survey Water-Supply Paper 494, published in 1923.

With respect to permanence, streams may be

divided into perennial streams, intermittent streams, and ephemeral streams.

A *perennial stream*, or stretch of a stream, is one that flows continuously. Perennial streams are generally fed in part by springs, and their upper surfaces generally stand lower than the water table in the localities through which they flow.

*Intermittent streams* may be divided, with respect to the source of their water, into spring-fed intermittent streams and surface-fed intermittent streams. They also flow in direct response to precipitation.

A *spring-fed intermittent stream*, or stretch of a stream, is one that flows only at certain times when it receives water from springs. The intermittent character of streams of this type is generally caused by fluctuations of the water table whereby the stream channels stand a part of the time below and part of the time above the water table. This is the ordinary type of intermittent stream.

A *surface-fed intermittent stream*, or stretch of a stream, is one that flows during protracted periods when it receives water from some surface source, generally the gradual and long-continued melting of snow in a mountainous or other cold tributary area. The term may be arbitrarily restricted to streams or stretches of streams that flow continuously during periods of at least one month.

An *ephemeral stream*, or stretch of a stream, is one that flows only in direct response to precipitation. It receives no water from springs and no long-continued supply from melting snow or other surface source. Its stream channel is at all times above the water table. The term may be arbitrarily restricted to streams or stretches of streams that do not flow continuously during periods of as much as one month.

With respect to continuity in space, streams may be divided into continuous streams and interrupted streams. An *interrupted stream* is one that contains (1) perennial stretches with intervening intermittent or ephemeral stretches or (2) intermittent stretches with intervening ephemeral stretches. These two classes of interrupted streams are designated, respectively, *perennial interrupted streams* and *intermittent interrupted streams*. A *continuous stream* is one that does not have interruptions in space. It may be perennial, intermittent, or ephemeral, but it does not habitually have wet and dry stretches.

INSTRUMENTATION describes type of runoff control or measuring device, number and type of precipitation gages, type of charts used, and snow courses, if employed.

WATERSHED CONDITIONS describes the general use and farm, forest, or range practices prior to the period of record and the conservation measures, crops, yields, and general cultural



operations and practices during the period of record. Rotation crops are listed in the order that they were grown. Operations are described with commonly used agricultural terms, and only those that appear to have a significant relationship to the hydrology of the watershed are mentioned.

GENERALLY REPRESENTS gives the broad area of application for which the data of the specific watershed are recommended. The areas named are those delineated on the map "Location of Experimental Agricultural Watersheds of the Agricultural Research Service." (See cover page 3.) The location of each project is shown by number on the Soil Conservation Service base map of numbered land resource areas in the United States prepared in January 1963. Solid red circles show the location of "continuing" or "new" watersheds, and open circles show areas where experimental studies have been discontinued, but for which records have been previously published in *References 1, 2, or 3.*

In some cases there is an apparent contradiction between the watershed location on the map and the descriptive information given under "Generally Represents." This is due to the small scale of the map; it is difficult to show many small local variations in boundaries of the land resource areas. The descriptive statements, rather than the map location, should be the guide to the application of the data.

## STANDARD SYMBOLS FOR TABULAR DATA

The following letters have been used as standard symbols throughout this volume to designate specific items or meanings:

- a*—used with clock time, and means before noon.
- p*—similar to "a" above, but means after-noon.
- m*—indicates 12:00 midnight.
- n*—similar to "m" above, but signifies 12:00 noon.
- e*—shows that a figure is estimated or partially estimated.
- T*—denotes a trace, generally less than 0.005 inch.
- nr*—used instead of a figure to indicate "no record."

## PERSONNEL RESPONSIBLE FOR COMPILATIONS

At each research location many individuals have contributed to the planning and establishment of the watersheds and the collection, compilation, and analysis of the data. Some of those who made substantial contributions to the success of the research work in this publication are as follows:

Location	Name or names
5	Harold W. Hobbs
8	William H. Speir, John C. Stephens
10	A. P. Barnett
11, 13, 15, 66	James B. Burford
21, 25, 61	Neal E. Minshall
23	Roy L. Roberts, Jr.
26	Lloyd L. Harrold, J. L. McGuinness
29, 31, 32	Keith E. Saxton
34, 42	Walter G. Knisel, Ralph W. Baird
37	William O. Ree, Wendell R. Gwinn
44	John A. Allis, Frank J. Dragoun
45, 47, 63, 64	Herbert B. Osborn, R. V. Keppel
62	W. Russell Hamon
65	John W. Neuberger
67	George H. Comer, Martin L. Johnson

## ADDITIONAL PUBLICATIONS BY LOCATION

In *Reference 1* (see p. 1), references to other publications that presented watershed data and interpretations of results in various journals, bulletins, and periodicals were given at the end of the introduction for many of the locations. Below is a listing, by location number, of additional references published through 1959. At the end, several that could not be tied to a specific location are listed in a general group.

### 8. Vero Beach, Fla.

CRAIG, A. L., and SEALE, C. C.

1954. BLENDED SOLVENTS FOR CONTROL OF THE SUBMERGED WATER WEED NAIAD IN SOUTH FLORIDA. *Weeds* 3 (2): 160-169.

STEPHENS, J. C.

1954. REVIEW OF METHODS AND FORMULATIONS FOR AQUATIC WEED CONTROL. *Soil Sci. Soc. Fla. Proc.* 14: 122-126.

1955. DRAINAGE OF PEAT AND MUCK LANDS. *In* Water, U.S. Dept. Agr. Yearbook: 539-557.

### 10. Watkinsville, Ga.

VAN BAVEL, C. H. M., and CARREKER, J. R.

1957. AGRICULTURAL DROUGHT IN GEORGIA. *Ga. Agr. Expt. Sta. Tech. Bul. N. S.* 15, 41 pp.

### 13. Blacksburg, Va.

BURFORD, J. B., and LILLARD, J. H.

1958. RUNOFF—HOW FAST AND HOW MUCH. *Soil Conserv.* 24: 81-83.

REE, W. O., and GWINN, W. R.

1959. THE VIRGINIA V-NOTCH WEIR. *U.S. Dept. Agr. ARS* 41-10, 7 pp.

VAN BAVEL, C. H. M., and LILLARD, J. H.

1957. AGRICULTURAL DROUGHT IN VIRGINIA. *Va. Agr. Expt. Sta. Tech. Bul.* 128, 28 pp.

17. *Edwardsville, Ill.*  
SHARP, A. L., HOLTAN, H. N., and MUSGRAVE, G. W.  
1949. INFILTRATION IN RELATION TO RUNOFF ON SMALL WATERSHEDS. U.S. Dept. Agr. SCS TP 81, 40 pp.
23. *East Lansing, Mich.*  
CRABB, G. A., JR.  
1952. INSULATION: A PRIMARY FACTOR IN EVAPORATION FROM A FREE WATER SURFACE IN MICHIGAN. Mich. Agr. Expt. Sta. Quart. Bul. 35: 186-192.  
1954. THE NORMAL ANNUAL PATTERN OF MEAN DAILY TEMPERATURES AT EAST LANSING, MICHIGAN. Mich. Agr. Expt. Sta. Quart. Bul. 36: 401-407.  
——— and SMITH, J. L.  
1953. SOIL TEMPERATURE COMPARISONS UNDER VARYING COVERS. Natl. Res. Council, Highway Res. Bd. Bul. 71: 32-80.  
HARROLD, L. L., and ROBERTS, R. L., JR.  
1960. WINTER RUNOFF FROM SNOW AND FROZEN GROUND. Mich. Agr. Expt. Sta. Quart. Bul. 43: 154-169.  
ROWLAND, E. F., STOLZY, L. H., and CRABB, G. A., JR.  
1955. FROST DETERMINATION BY ELECTRICAL RESISTANCE. Natl. Res. Council, Highway Res. Bd. Bul. 100: 17-21.  
SMITH, J. L., and CRABB, G. A., JR.  
1956. PATTERNS AND CLASSES OF RAINFALL AT EAST LANSING, MICHIGAN, AND THEIR EFFECT UPON SURFACE RUNOFF. Mich. Agr. Expt. Sta. Quart. Bul. 39: 47-62.
24. *Bethany, Mo.*  
JAMISON, V. C., and THORNTON, J. E.  
1959. WATER INTAKE RATES OF SHELBY-GRUNDY SOILS FROM HYDROGRAPH ANALYSIS. Amer. Soc. Agr. Engin. Trans. 2 (1): 92-94.  
ZINGG, A. W.  
1944. THE DETERMINATION OF INFILTRATION-RATES ON SMALL AGRICULTURAL WATERSHEDS. Amer. Geophys. Union Trans. pt. 2: 475-480.
25. *McCredie, Mo.*  
SMITH, D. D.  
1955. STORAGE POND DESIGN. Agr. Engin. 36 (11): 743-746.
26. *Coshocton, Ohio.*  
DREIBELBIS, F. R.  
1941. A SUMMARY OF SOIL-MOISTURE DATA USEFUL IN SOIL-AND-WATER CONSERVATION INVESTIGATIONS. Amer. Geophys. Union Trans. Pt. 2: 1041-1047.  
1942. AN INVENTORY OF SOIL WATER RELATIONSHIPS ON WOODLAND, PASTURE AND CULTIVATED SOILS. Soil Sci. Soc. Amer. Proc. 6: 462-473.  
1944. SOME SEASONAL CHANGES IN PORE SPACE AND MOISTURE RELATIONSHIPS OF WOODLAND, PASTURE, AND CULTIVATED SOILS. Soil Sci. Soc. Amer. Proc. 8: 102-108.  
1949. SOME INFLUENCES OF FROST PENETRATION ON THE HYDROLOGY OF SMALL WATERSHEDS. Amer. Geophys. Union Trans. 30: 279-282.  
——— and HARROLD, L. L.  
1946. A SUMMARY OF PERCOLATION AND OTHER HYDROLOGIC DATA OBTAINED FROM THE COSHOCTON MONOLITH LYSIMETERS. Soil Sci. Soc. Amer. Proc. 10: 451-457.
- and POST, F. A.  
1941. STUDIES ON SOIL MOISTURE RELATIONSHIPS AT THE NORTH APPALACHIAN EXPERIMENTAL WATERSHED. Soil Sci. Soc. Amer. Proc. 5: 377-385.
- HARROLD, L. L.  
1947. COMPARISON OF LYSIMETER RUNOFF, INFILTRATION, AND PERCOLATION TO STREAM-FLOW. Amer. Geophys. Union Trans. 28: 438-442.  
1947. LAND USE PRACTICES ON RUNOFF AND EROSION FROM AGRICULTURAL WATERSHEDS. Agr. Engin. 28: 563-566.  
1949. HAS THE SMALL AREA FLOOD BEEN NEGLECTED? Civil Engin. 19: 690-691.  
1954. RELATION OF PLANT COVER AND LAND USE TO WATER INTAKE AND GROUND WATER. Ohio Water Clinic Proc. 3: 90-96. (Engin. Expt. Sta. Special Rep. Aug. 1954.)  
1955. BEHAVIOR OF WATER ON LAND. Jour. Soil and Water Conserv. 10 (6): 277-280.  
1957. MINIMUM WATER YIELD FROM SMALL AGRICULTURAL WATERSHEDS. Amer. Geophys. Union Trans. 38: 201-208.  
——— and DREIBELBIS, F. R.  
1958. EVALUATION OF AGRICULTURAL HYDROLOGY BY MONOLITH LYSIMETERS, 1944-55. U.S. Dept. Agr. Tech. Bul. 1179, 166 pp.
- POST, F. A., and DREIBELBIS, F. R.  
1943. SOME INFLUENCES OF FROST PENETRATION AND MICROCLIMATE ON THE WATER RELATIONSHIPS OF WOODLAND, PASTURE, AND CULTIVATED SOILS. Soil Sci. Soc. Amer. Proc. 7: 95-104.
- SCHIFF, LEONARD.  
1949. MOVEMENT OF WATER WITHIN THE SOIL AND SURFACE RUNOFF WITH REFERENCE TO LAND AND SOIL PROPERTIES. Amer. Geophys. Union Trans. 30: 401-411.  
——— and DREIBELBIS, F. R.  
1949. INFILTRATION, SOIL MOISTURE, AND LAND USE RELATIONSHIPS WITH REFERENCE TO SURFACE RUNOFF. Amer. Geophys. Union Trans. 30: 75-88.
37. *Stillwater, Okla.*  
REE, W. O.  
1952. THE USE OF GRASS IN WATERWAYS. 6th Ann. Grassland Cong. Proc. 2: 991-996.  
1958. RETARDANCE COEFFICIENTS FOR ROW CROPS IN DIVERSION TERRACES. Amer. Soc. Agr. Engin. Trans. 1 (1): 78-80.
42. *Riesel (Waco), Tex.*  
BAIRD, R. W., HARTMAN, M. A., POPE, J. B., and KNISEL, W. G.  
1958. SURFACE RUNOFF AS AFFECTED BY SOIL CONSERVATION PRACTICES. 4th Ann. Conf. on Water for Texas. Proc.  
HARTMAN, M. A., BAIRD, R. W., POPE, J. B., and KNISEL, W. G.  
1959. PREDICTION OF SOIL MOISTURE FROM RAINFALL AND PAN EVAPORATION RECORDS. (Abstract) Assoc. South. Agr. Workers Proc. 56th Ann. Convention: 71. (Presented to Assoc. South. Agr. Workers, Memphis, Tenn., Feb. 1956.)
44. *Hastings, Nebr.*  
ALLIS, J. A.  
1948. RATES OF RUNOFF FOR DESIGN OF CONSERVATION STRUCTURES IN THE CENTRAL GREAT PLAINS OF NEBRASKA AND KANSAS. U.S. Dept. Agr. SCS TP 69, 30 pp.



1953. RUNOFF FROM CONSERVATION AND NON-CONSERVATION WATERSHEDS. *Agr. Engin.* 34: 766-768.
- and KELLY, L. L.  
1958. RUNOFF FROM SMALL WATERSHEDS. *Soil Conserv.* 23: 164-166.
46. *Colorado Springs, Colo.*  
See reference listed under location 17.
61. *Monticello, Ill.*  
HUFF, F. A., and NEILL, J. C.  
1957. RAINFALL RELATIONS ON SMALL AREAS IN ILLINOIS. *Ill. State Water Survey Bul.* 44, 61 pp.
67. *North Danville, Vt.*  
PALMER, R. S.  
1958. AGRICULTURAL DROUGHT IN NEW ENGLAND. *N. H. Agr. Expt. Sta. Tech. Bul.* 97, 51 pp.
- General References*  
ACKERMANN, W. C.  
1955. ON DOING WATERSHED RESEARCH. *Soil Conserv.* 20 (8): 189-190.
- BLAISDELL, F. W.  
1959. THE SAF STILLING BASIN—A STRUCTURE TO DISSIPATE THE DESTRUCTIVE ENERGY IN HIGH-VELOCITY FLOW FROM SPILLWAYS. *U.S. Dept. Agr. Agr. Handb.* 156, 16 pp.
- and DONNELLY, C. A.  
1956. THE BOX INLET DROP SPILLWAY AND ITS OUTLET. *Amer. Soc. Civil Engin. Trans.* 121: 955-994, (incl. disc. by Minshall, N. E.).
- BRAKENSIEK, D. L.  
1958. FITTING A GENERALIZED LOG-NORMAL DISTRIBUTION TO HYDROLOGIC DATA. *Amer. Geophys. Union Trans.* 39: 469-473.
- 1959. SELECTING THE WATER YEAR FOR SMALL AGRICULTURAL WATERSHEDS. *Amer. Soc. Agr. Engin. Trans.* 2 (1): 5-8, 10.
- and ZINGG, A. W.  
1957. APPLICATION OF EXTREME VALUE STATISTICAL DISTRIBUTION TO ANNUAL PRECIPITATION AND CROP YIELDS. *U.S. Dept. Agr. ARS* 41-13, 14 pp.
- COOK, H. L., and PARSONS, D. A.  
1953. CHARACTERISTICS OF TIPPING-BUCKET DEVICES. *Amer. Geophys. Union Trans.* 34 (1): 85-94.
- DONNELLY, C. A., and BLAISDELL, F. W.  
1954. STRAIGHT DROP SPILLWAY STILLING BASIN. *St. Anthony Falls Hydraul. Lab. Tech. Paper* 15-8, 35 pp.
- FLETCHER, J. E.  
1949. SOME PROPERTIES OF WATER SOLUTIONS THAT INFLUENCE INFILTRATION. *Amer. Geophys. Union Trans.* 30 (4): 548-554.
- GLYMPH, L. M., JR.  
1954. WATER EROSION PROBLEMS AND CONTROL ON NON-IRRIGATED AGRICULTURAL LANDS. *Amer. Geophys. Union Trans.* 35: 246-252.
- 1954. STUDIES OF SEDIMENT YIELDS FROM WATERSHEDS. *Assoc. Internatl. Hydrol. Sci. Pub.* 36: 178-191. Rome, Italy.
- HARROLD, L. L.  
1952. EFFECT OF INCREASING GRASSLAND ON WATER YIELD IN HUMID AREAS. *6th Ann. Grassland Cong. Proc.* 2: 1070-1075.
- HICKOK, R. B., KEPPEL, R. V., and RAFFERTY, B. R.  
1959. HYDROGRAPH SYNTHESIS FOR SMALL ARID LAND WATERSHEDS. *Agr. Engin.* 40: 608-611, 615.
- HOLTAN, H. N., MINSHALL, N. E., and HARROLD, L. L.  
1962. FIELD MANUAL FOR RESEARCH IN AGRICULTURAL HYDROLOGY. *U.S. Dept. Agr. Agr. Handb.* 224, 215 pp.
- INTER-AGENCY COMMITTEE ON WATER RESOURCES, SUBCOMMITTEE ON HYDROLOGY.  
1956. PRINCIPAL FEDERAL SOURCES OF HYDROLOGIC DATA. *Notes on Hydrol. Activ. Bul.* 8: v. 1, 50 pp.; v. 2, 139 pp.
- KEPPEL, R. V., and FLETCHER, J. E.  
1959. WATER IN THE SOUTHWEST. *Soil Conserv.* 25: 54-56.
- MARSCHNER, F. J.  
1959. LAND USE AND ITS PATTERNS IN THE UNITED STATES. *U.S. Dept. Agr. Agr. Handb.* 153, 277 pp.
- MINSHALL, N. E.  
1955. EVALUATION OF GULLY CONTROL STRUCTURES. *Agr. Engin.* 36: 35-37. (See also *U.S. Dept. Agr. SCS TP* 116, Sept. 1953.)
- NECE, R. E., GIVLER, C. A., and DRINKER, P. A.  
1959. MEASUREMENT OF BOUNDARY SHEAR STRESS IN AN OPEN CHANNEL CURVE WITH A SURFACE PITOT TUBE. *Mass. Inst. Tech. Hydrodyn. Lab. Tech. Note* 6.
- NEFF, E. L., and SHEFFER, P. C.  
1959. DETERMINATION OF PEAK DISCHARGE-FREQUENCY RELATIONSHIPS FOR STREAMS WITHIN A SELECTED AREA IN CALIFORNIA. *U.S. Dept. Agr. ARS* 41-32, 20 pp.
- PARSONS, D. A.  
1941. CALIBRATION OF A WEATHER BUREAU TIPPING-BUCKET RAIN GAGE. *U.S. Monthly Weather Rev.* 69: 205.
- 1954. COSHOCTON-TYPE RUNOFF SAMPLERS, LABORATORY INVESTIGATIONS. *U.S. Dept. Agr. SCS TP* 124, 16 pp.
- 1955. COSHOCTON-TYPE RUNOFF SAMPLERS—SUPPLEMENTARY LABORATORY INVESTIGATIONS. *U.S. Dept. Agr. ARS* 41-2, 15 pp.
- POTTER, W. D.  
1958. UPPER AND LOWER FREQUENCY CURVES FOR PEAK RATES OF RUNOFF. *Amer. Geophys. Union Trans.* 39: 100-105. (Discuss., 5 p. 1165-1170, Dec. 1958).
- REE, W. O., and PALMER, V. J.  
1949. FLOW OF WATER IN CHANNELS PROTECTED BY VEGETATIVE LININGS. *U.S. Dept. Agr. Tech. Bul.* 967, 115 pp.
- SHARP, A. L.  
1959. EVAPORATION FACTOR. *Jour. Soil and Water Conserv.* 14 (2): 77-78. (A discussion of "Factors Affecting Evaporation from Plants and Soils" by C. B. Tanner. *Jour. Soil and Water Conserv.* 12 (5): 221-227. 1957.)
- U.S. DEPARTMENT OF AGRICULTURE.  
1955. WATER. *Yearbook of Agriculture*, 751 pp.
- 1957. SOIL. *Yearbook of Agriculture*, 784 pp.
- WISCHMEIER, W. H., and SMITH, D. D.  
1958. RAINFALL ENERGY AND ITS RELATION TO SOIL LOSS. *Amer. Geophys. Union Trans.* 39 (2): 285-291.

TABLE 1.—*Watersheds where observations were discontinued before January 1, 1956*

[Hydrologic data were published in References 1, 2, and 3]

State	Locality	Discontinued watershed units		
		Number	Record period <sup>1</sup>	Location No.
Alabama	Auburn	1	1945-47	7
Arkansas	Bentonville	6	1933-47 (SE)	33
California	{ Placerville	1	1936-44 (SE)	50
	{ Santa Paula	9	1934-43	51
	{ Sebastopol	2	1936-43 (SE)	52
	{ Vacaville	1	1936-42	53
	{ Watsonville	4	1938-42 (SE)	54
Colorado	Colorado Springs	4	1938-46 (SE)	46
Georgia	Americus	4	1938-43 (SE)	9
Idaho	{ Emmett	2	1938-41 (SE)	55
	{ Moscow	2	1937-42 (SE)	56
Illinois	{ Edwardsville	4	1938-55 (SE)	17
	{ Elmwood	12	1945-46	18
Indiana	Lafayette	20	1940-53 (SE)	19
Iowa	{ Clarinda	5	1932-42	20
	{ Shenandoah	2	1934-40	22
Kansas	Hays	2	1932-47	43
Maryland	{ College Park	8	1939-54 (SE)	5
	{ Hagerstown	2	1938-47 (SE)	6
Missouri	Bethany	8	1932-42 (SE)	24
Nebraska	Hastings	15	1939-54 (SE)	44
New Jersey	Freehold	3	1938-43 (SE) <sup>2</sup>	4
New Mexico	{ Mexican Springs	12	1937-42 (SE)	48
	{ Santa Fe	3	1939-48 (SE)	49
New York	{ Arnot Forest	2	1941-47	1
	{ Cohocton	2	1938-45 (SE)	2
North Carolina	{ High Point	2	1934-41 (SE)	11
	{ Statesville	2	1933-38	12
Ohio	{ Coshocton	4	1937-47 (SE)	26
	{ Hamilton	4	1938-44 (SE)	27
	{ Zanesville	3	1934-45	28
Oklahoma	{ Guthrie	11	1930-55 (SE) <sup>3</sup>	35
	{ Muskogee	3	1938-47	36
Oregon	Newberg	4	1938-42 (SE)	57
Texas	{ Garland	3	1938-47	38
	{ Riesel (Waco)	14	1937-43 (SE)	42
	{ Spur	9	1927-45	39
	{ Tyler	4	1931-44 (SE)	40
	{ Vega	2	1938-43 (SE)	41
Virginia	{ Chatham (Danville)	3	1938-48 (SE)	14
	{ Staunton	2	1948-55 (SE)	15
Washington	{ Dayton	1	1939-42	58
	{ Pullman <sup>4</sup>	3	1934-40	59
	{ Pullman <sup>5</sup>	8	1931-47 (SE)	60
Wisconsin	{ Coon Valley	2	1934-40	30
	{ La Crosse	4	1933-54 <sup>6</sup>	32

<sup>1</sup> (SE) indicates locations where selected runoff events were published in Reference 3.

<sup>2</sup> One watershed also operated during 1950-55.

<sup>3</sup> Watersheds operated for varying periods of 12 to 23 years.

<sup>4</sup> SCS Demonstration Project.

<sup>5</sup> Soil and Water Conservation Experiment Station.

<sup>6</sup> One watershed discontinued in 1942, 2 in 1947.



TABLE 2.—*Experimental agricultural watershed research locations  
for 1956-59 hydrologic data*

State	Locality	Watershed units (number)	Assigned location No.
Arizona.....	{ Safford.....	4	45
	{ Tombstone.....	<sup>1</sup> 5	63
Florida.....	Vero Beach.....	3	8
Georgia.....	Watkinsville.....	1	10
Illinois.....	Monticello.....	2	61
Iowa.....	Iowa City.....	1	21
Maryland.....	College Park.....	2	5
Michigan.....	East Lansing.....	3	23
Mississippi.....	Oxford.....	<sup>2</sup> 16	62
Missouri.....	McCredie.....	2	25
Nebraska.....	Hastings.....	13	44
New Mexico.....	{ Albuquerque.....	3	47
	{ Santa Rosa.....	<sup>1</sup> 1	64
North Carolina.....	High Point.....	<sup>3</sup> 1	11
Ohio.....	Coshocton.....	37	26
Oklahoma.....	{ Cherokee.....	9	34
	{ Stillwater.....	3	37
South Dakota.....	Newell.....	<sup>1</sup> 15	65
Texas.....	Riesel (Waco).....	16	42
Vermont.....	North Danville.....	<sup>1</sup> 2	67
Virginia.....	{ Blacksburg.....	<sup>4</sup> 6	13
	{ Staunton.....	1	15
West Virginia.....	Moorefield.....	<sup>1</sup> 4	66
Wisconsin.....	{ Colby.....	1	29
	{ Fennimore.....	4	31
	{ La Crosse.....	2	32

<sup>1</sup> New watersheds, previously unreported.

<sup>2</sup> New watersheds, but selected events for 4 previously reported.

<sup>3</sup> Current data for 1 watershed with revised sheets for 2 discontinued watersheds.

<sup>4</sup> Includes data for 2 new watersheds.



**WATERSHED DATA BY LOCATION**

**NUMBER AND DECIMAL PAGING**

**[5.6-1 to 67.2-4, a total of 600 data sheets]**

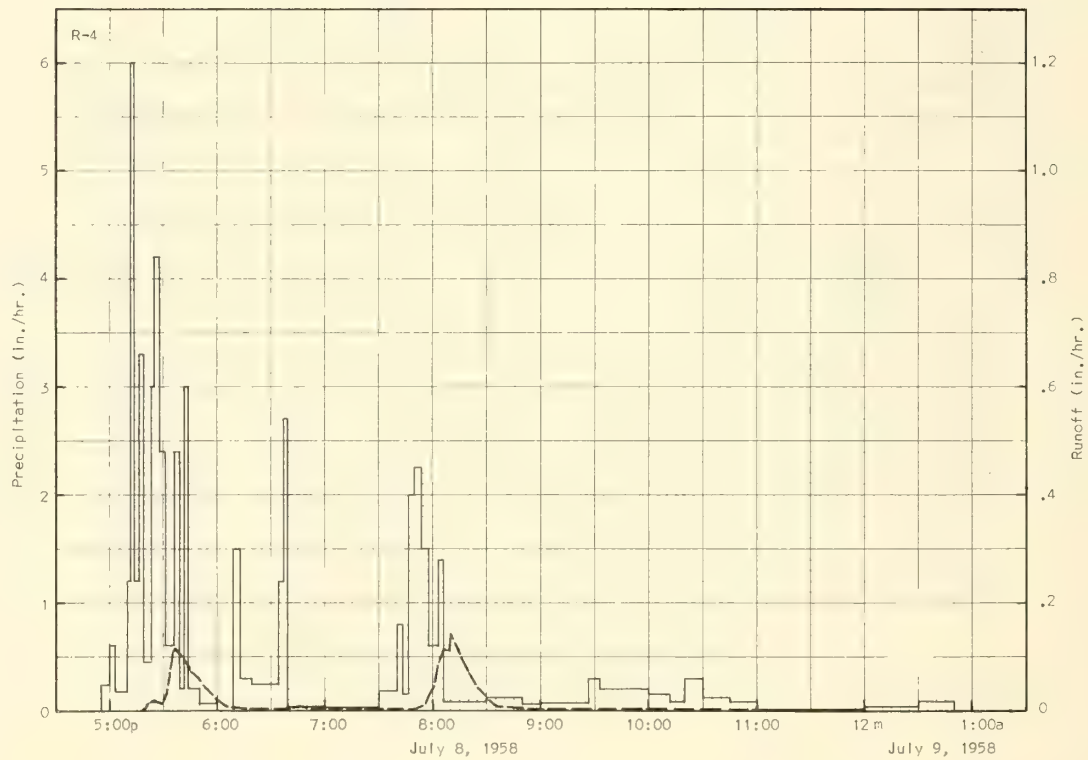
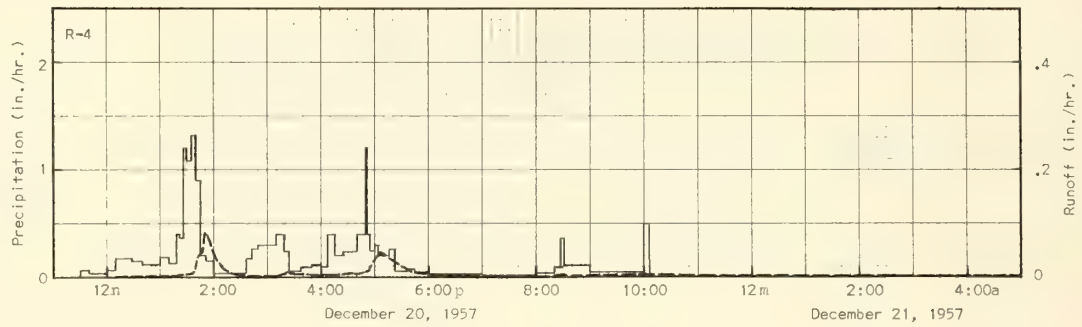


MONTHLY PRECIPITATION AND RUNOFF (Inches)							College Park, Maryland, Watershed W-6 (Area - 3.53 acres)												
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year						
1956 P Q	2.32 T	3.01 .01	3.88 T	1.99 T	2.31 T	3.27 .01	5.67 .01	1.99 T	3.90 .01	2.99 T	2.49 T	2.97 T	36.79 .04						
1957 P Q	2.35 T	2.87 T	2.48 .01	3.24 .01	1.75 .01	3.97 .01	2.39 .02	2.94 .01	3.95 .01	2.56 .01	3.67 .01	5.78 .10	37.95 .20						
1958 P Q	2.96 .28	3.42 .11	6.67 .03	4.42 .01	3.18 .01	4.11 .01	6.69 .14	5.22 .05	1.44 T	2.22 T	2.35 T	1.39 0	44.07 .64						
1959 P Q	2.45 T	2.01 .01	2.54 .01	4.14 .01	2.18 T	4.11 .01	5.86 .02	3.52 .03	1.96 T	3.23 .02	2.79 .01	2.92 T	36.67 .12						
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							College Park, Maryland, Watershed W-6												
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL																
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days				
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.			
1958	1-25	0.24	1-25	0.15	1-25	0.18	1-24	0.19	1-24	0.20	1-24	0.20	1-24	0.20	1-21	0.23			
1959	1-1	.05	1-1	.02	8-8	.02	8-8	.02	8-8	.02	8-8	.02	8-8	.02	8-8	.02			
Watershed Conditions: Bluegrass and white clover pasture 1 to 1½ inches high, mostly dormant. Had been heavily grazed by 9 to 15 head of 2-year-old steers April through October. Pasture mowed occasionally for weed control and																			
SELECTED RUNOFF EVENTS							College Park, Maryland, Watershed W-6												
Antecedent conditions				Rainfall				Runoff											
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)									
Event - December 21-22, 1957																			
12-21	.23	T		12-20-57	Raingage	R-4		12-20-57											
12-21	.28	0		12:00a	0	0		12:10a	0	0									
12-21	.56	.0016		12:40	.01	.01		1:24	.0005	.0004									
12-23	.07 s	0		12:00a	.03	.02		1:36	.0040	.0008									
12-24	.46 s	0		10p	.03	.03		1:56	.010	.0010									
12-7	.68			12:28	.17	.20		1:40	.026	.0016									
12-8	.28			12:40	.15	.11		1:41	.035	.0021									
12-9	.61	.0011		1:12	.12	.15		1:45	.044	.0047									
12-11	.12 s	0		12:10	.18	.18		1:47	.044	.0062									
12-20	.11	.0015 1/		12:19	.13	.20		1:48	.062	.0070									
Watershed Conditions: Bluegrass and white clover pasture 1 to 1½ inches high, mostly dormant. Had been heavily grazed April through October. Pasture mowed occasionally for weed control and				12:22	.40	.22		1:49	.079	.0082									
				12:27	.36	.25		1:51	.085	.0109									
				12:30	.31	.31		1:56	.062	.0170									
				12:35	1.08	.40		2:00	.044	.0205									
				12:40	1.32	.51		2:04	.029	.0229									
				12:42	.	.63		2:10	.015	.0251									
				12:52	.20	.62		2:16	.008	.0263									
				12:00	.15	.64		2:22	.0040	.0269									
				12:36	.03	.66		2:32	.0013	.0273									
				12:44	.17	.68		2:40	.0006	.0274									
				12:50	.26	.71		3:12	.0006	.0277									
				12:30	.30	.76		3:15	.003	.0278									
				12:10	.30	.81		3:20	.0052	.0282									
				12:11	.40	.87		3:24	.007	.0286									
				12:24	.24	.89		3:34	.0040	.0295									
				12:37	.05	.90		3:46	.0021	.0301									
				12:50	.09	.92		3:58	.0013	.0304									
				12:00	.12	.94		4:04	.0021	.0306									
				12:07	.09	.95		4:20	.0021	.0311									
				12:16	.40	1.01		4:27	.0029	.0314									
Notes: To convert runoff in in/hr to cfs multiply by 3.56. "s" denotes snow under antecedent precipitation. 1/ Prior to 10:00a, 12-20-57. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS, SWC, January 1960, page 5.6-6.																			

SELECTED RUNOFF EVENTS						College Park, Maryland, Watershed W-6		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of December 20-21, 1957 - Continued								
			4:25p	.20	1.04	3:36 p	.0052	.0320
			:41	.23	1.10	:40	.0040	.0323
			:50	.40	1.16	:48	.007	.0330
			:52	1.20	1.20	4:51	.010	.0335
			:55	.40	1.22	:54	.011	.0340
			5:00	.24	1.24	:57	.026	.0349
			:04	.30	1.26	5:01	.035	.0370
			:16	.20	1.30	:06	.047	.0404
			:23	.26	1.33	:15	.035	.0465
			:36	.05	1.34	:25	.024	.0514
			:45	.07	1.35	:39	.011	.0555
			6:00	.04	1.36	:50	.0052	.0570
			7:00	.02	1.38	6:04	.0021	.0579
			8:00	.01	1.39	7:20	.0002	.0586
			:20	.03	1.40	8:14	.0002	.0587
			:27	.09	1.41	:28	.0006	.0588
			:32	.36	1.44	:38	.0002	.0589
			9:00	.11	1.49	10:00	.0006	.0595
			10:00	.04	1.53	12:00m	.0002	.0603
			:06	.50	1.57	12-21-57		
						5:00a	0	.0608
Event of July 8-9, 1958								
6-9-58	.12	0	7-8-58	Raingage	R-4	7-8-58		
6-10	.85	.0027	4:55p	0	0	5:18p	0	0
6-11	.41	.0005	5:00	.24	.02	:20	.0040	.0001
6-13	.20	0	:03	.60	.05	:21	.011	.0002
6-20	.69	.0017	:10	.17	.07	:25	.017	.0011
6-21	.82	.0010	:12	1.20	.11	:29	.011	.0021
6-22	.02	0	:14	6.00	.31	:32	.035	.0032
6-26	.32	0	:17	1.20	.37	:33	.070	.0041
7-4	.15	0	:19	3.30	.48	:35	.103	.0070
7-6	.14	0	:23	.45	.51	:37	.113	.0106
7-7	.24 1/	.0004 2/	:25	3.00	.61	:42	.093	.0192
Watershed Conditions: Bluegrass and white clover pasture 2 to 4 inches high. Grazed by 9 head of beef cattle beginning in April. Common fertilization. Weeds and excess growth mowed to 4-inch height late in June.			:28	4.20	.82	:46	.066	.0244
			:31	2.40	.94	:48	.062	.0266
			:36	.60	.99	:53	.041	.0308
			:39	2.40	1.11	:59	.019	.0338
			:42	.20	1.12	6:06	.0052	.0353
			:44	3.00	1.22	:15	.0006	.0357
			:50	.20	1.24	:40	.0002	.0359
			6:00	.06	1.25	:45	.0040	.0360
			ceased	-	-	:57	.0002	.0365
			:09	0	1.25	7:00	.0013	.0365
			:13	1.50	1.35	:06	.0013	.0366
			:19	.30	1.38	:24	.0002	.0369
			:34	.24	1.40	:50	.0002	.0369
			:37	1.20	1.46	:56	.011	.0375
			:39	2.70	1.55	:58	.029	.0382
			7:00	.03	1.56	8:01	.044	.0400
			:30	.02	1.57	:03	.083	.0421
			:40	.18	1.60	:06	.113	.0470
			:43	.80	1.64	:09	.108	.0526
			:47	.15	1.65	:10	.142	.0546
			:50	2.00	1.75	:15	.103	.0648
			:54	2.25	1.90	:19	.074	.0707
			:58	1.50	2.00	:23	.047	.0748
			11:00	.60	2.02	:30	.024	.0789
			:03	.60	2.05	:40	.010	.0817
			:06	1.40	2.12	:49	.0029	.0826
			:30	.08	2.15	9:02	.0002	.0830
			:50	.12	2.19	12:00m	0	.0833
			9:00	.06	2.20			
Notes: To convert runoff in in/hr to cfs multiply by 3.56.								
1/ Rain 4:20p to 6:40p.								
2/ Runoff ended 9:00p.								

SELECTED RUNOFF EVENTS						College Park, Maryland, Watershed W-6		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 8-9, 1958 - Continued								
			9:27p	.07	2.23			
			:33	.30	2.26			
			10:00	.20	2.35			
			:12	.15	2.38			
			:20	.08	2.39			
			:30	.30	2.44			
			:45	.12	2.47			
			11:00	.08	2.49			
			12:00m	.01	2.50			
			7-9-58					
			12:30a	.04	2.52			
			:50	.09	2.55			
Notes: To convert runoff in in/hr to cfs multiply by 3.56.								





COLLEGE PARK, MARYLAND WATERSHED W-6



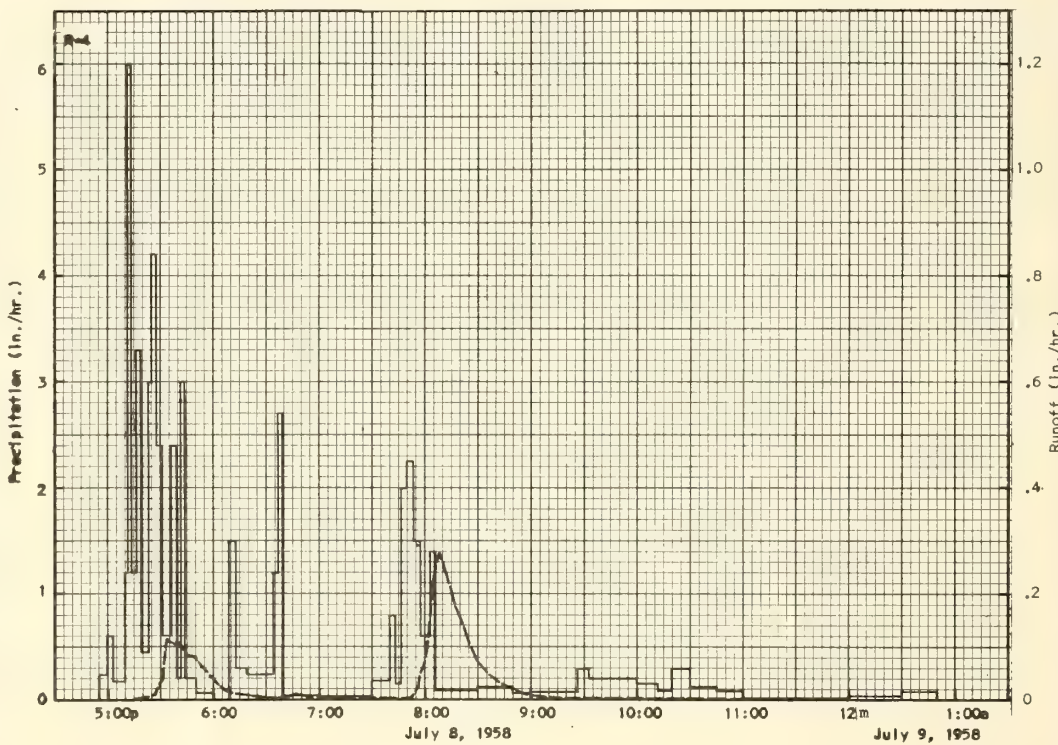
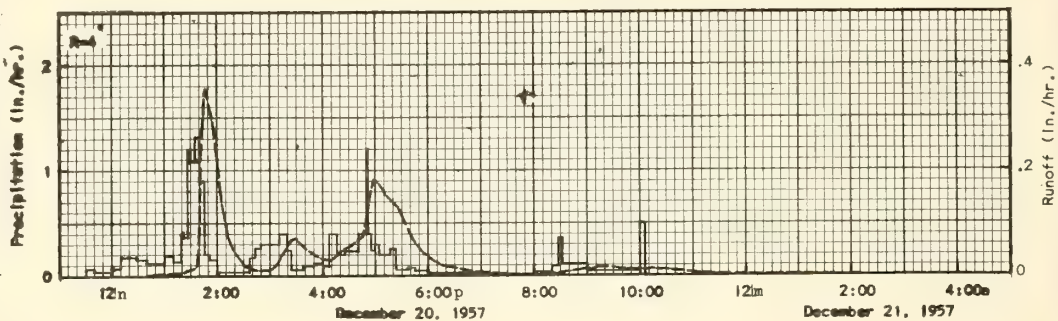
MONTHLY PRECIPITATION AND RUNOFF (Inches)													College Park, Maryland Watershed W-7 (Area = 3.52 acres)			
Month Year		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P Q	2.32 T	3.01 .04	3.88 .13	1.99 0	2.31 .01	3.27 T	5.67 .1	1.99 T	3.90 .03	2.99 .01	2.49 T	2.97 .01	36.79 .24		
1957	P Q	2.35 0	2.87 0	2.48 T	3.24 .09	1.75 T	3.97 .1	2.39 .01	2.94 T	3.95 .01	2.56 T	3.67 .01	5.78 .76	37.95 .91		
	P Q	2.96 .32	3.42 .78	6.67 1.29	4.11 .09	3.18 .03	4.11 .01	6.69 .28	5.22 .09	1.44 T	2.22 T	2.35 .01	1.39 0	44.07 2.90		
1959	P Q	2.45 .01	2.01 .01	2.54 T	1.14 .02	2.18 T	3.07 .1	5.86 .02	3.52 .02	1.44 T	3.23 .01	2.79 .01	2.92 T	36.67 .11		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								College Park, Maryland Watershed W-7								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958	7-22	0.30	7-22		7-22	0.12	3-25	0.25	3-25	0.41	3-25	0.59	3-25	0.73	3-19	1.29
	8-8	.04			8-8	.02	8-8	.02	8-8	.02	8-8	.02	8-8	.02	8-8	.02
Notes: Monthly precipitation and runoff data for 1956, 1957, and 1959 are from the College Park, Maryland Watershed W-7. Quality of runoff data: monthly P and Q, discharges and volumes, excellent, except values for 6 hours to 8 days (3-19 to 3-27-58) which are fair and probably by rotation grazing through October. 1957 and 58 rotation grazing by 9 to 14 2-year-old steers April through October. 1956-59 .80 T/ac orchard grass hay removed, then rotation grazing through October. Spring fertilization 350 #/ac of																
SELECTED RUNOFF EVENTS								College Park, Maryland Watershed W-7								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)						
Event of December 20-21, 1957																
11-23-57	0.23	T		12-20-57	Raingage	R-4		12-20-57								
11-24	.28	0		11:30a	0			12:42p	0	0						
11-25	.56	.0012		:40	.06	.01		1:25	.007	.0014						
12-3	.07 s			12:00n	.03	.02		:32	.012	.0024						
12-4		0		:10	.06	.03		:36	.017	.0034						
12-7	.68	T		:28	.17	.08		:37	.038	.0039						
12-8	.28	.0260		:4	.15	.11		:38	.058	.0047						
12-9	.61	.0383		:00	.12	.15		:4	.103	.0060						
12-11	.12 s			:10	.18	.18		:4	.14	.0084						
12-20				:19	.20	.20		:42	.251	.0158						
Antecedent conditions: Orchard grass pasture, 12-19, 1957, high, mostly dormant. Had been heavily grazed April through October 1957 by 14 head of deer cattle. Cows on 12-3, 4 and 11 had completely melted before rain of 12-20. No frost in pasture.																
				:22	.40	.22		:44	.304	.0250						
				:27	.36	.25		:45	.344	.0304						
				:30	1.20	.31		:46	.355	.0362						
				:35	1.08	.40		:4	.324	.0588						
				:40	1.32	.51		:4	.287	.0792						
				:4	.90	.60		:58	.235	.0965						
				:52	.20	.62		2:14	.114	.114						
				2:00	.15	.64		:08	.117	.1236						
				:36	.03	.66		:12	.074	.1295						
				:47	.17	.68		:18	.047	.1367						
				:50	.26	.71		:26	.027	.1405						
				:1	.30	.76		:32	.017	.1426						
				:10	.30	.81		:4	.010	.1444						
				:19	.40	.87		:48	.007	.1455						
				:24	.24	.89		:58	.038	.1468						
				:37	.05	.90		3:02	.012	.1474						
				:50	.09	.92		:08	.022	.1491						
				4:00	.12	.94		:14	.041	.1522						
				:07	.95	.95		:20	.058	.1571						
				:16	.40	1.01		:24	.066	.1613						
Notes: To convert runoff in inches to ft multiply by 6.7549. "s" denotes snow under antecedent precipitation. 1. Prior to 11:00a, 12-20-57. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS, SWC, January 1960, page 5.6-6.																

Cooperative Research Project of USDA and Maryland Agricultural Experiment Station

SELECTED RUNOFF EVENTS						College Park, Maryland Watershed W-7		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of December 20-21, 1957 - Continued								
			4:25p	.20	1.04	3:28p	.070	.1658
			:41	.23	1.10	:36	.058	.1744
			:50	.40	1.16	:44	.047	.1814
			:52	1.20	1.20	:54	.038	.1885
			:55	.40	1.22	4:00	.032	.1920
			5:00	.24	1.24	:08	.029	.1960
			:04	.30	1.26	:15	.038	.1999
			:16	.20	1.30	:25	.051	.2073
			:23	.26	1.33	:32	.058	.2137
			:36	.05	1.34	:40	.062	.2217
			:45	.07	1.35	:44	.074	.2262
			6:00	.04	1.36	:48	.093	.2318
			7:00	.02	1.38	:52	.136	.2394
			8:00	.01	1.39	:54	.161	.2444
			:20	.03	1.40	:58	.182	.2558
			:27	.09	1.41	5:04	.175	.2737
			:32	.36	1.44	:13	.148	.2979
			9:00	.11	1.49	:24	.130	.3234
			10:00	.04	1.53	:33	.098	.3405
			:06	.50	1.57	:40	.074	.3505
						:50	.051	.3610
						6:00	.035	.3681
						:16	.019	.3753
						:36	.010	.3801
						:54	.0052	.3824
						7:12	.0030	.3836
						:28	.0021	.3843
						8:16	.0005	.3854
						:28	.0021	.3856
						:34	.0052	.3860
						:44	.007	.3870
						:52	.010	.3881
						9:08	.013	.3912
						:12	.015	.3921
						:24	.015	.3951
						:36	.013	.3980
						:48	.010	.4003
						10:06	.010	.4032
						:14	.012	.4047
						:20	.010	.4057
						:30	.010	.4074
						:54	.0052	.4104
						11:24	.0021	.4122
						12:00m	.0006	.4130
						12-21-57		
						2:10a	0	.4136
Event of July 8-9, 1958								
6-9-58	.12	0	7-8-58	Rainage	R-4	7-8-58		
6-10	.85	.0006	4:55p	0	0	5:15p	0	0
6-11	.41	.0003	5:00	.24	.02	:27	.008	.0010
6-13	.20	0	:03	.60	.05	:29	.022	.0015
6-20	.69	.0017	:10	.17	.07	:31	.038	.0025
6-21	.82	.0016	:12	1.20	.11	:34	.114	.0054
6-22	.02	0	:14	6.00	.31	:38	.103	.0136
6-26	.32	0	:17	1.20	.37	:41	.103	.0187
7-4	.15	0	:19	3.30	.48	:45	.083	.0249
7-6	.14	0	:23	.45	.51	:49	.083	.0305
7-7	.24 1/	.0004 2/	:25	3.00	.61	:53	.066	.0354
Watershed Conditions: Bluegrass and orchard grass pasture 2 to 4 inches high. Grazed by 9 head of beef cattle beginning in April. Common fertilization. Weeds and excess growth mowed to 4-inch height late in June.			:28	4.20	.82	:58	.044	.0400
			:31	2.40	.94	6:03	.027	.0430
			:36	.60	.99	:07	.017	.0444
			:39	2.40	1.11	:14	.008	.0459
Notes: To convert runoff in in/hr to cfs multiply by 3.549								
1/ Rain 4:20p to 6:40p.								
2/ Runoff ended 9:00p.								

SELECTED RUNOFF EVENTS						College Park, Maryland Watershed W-7		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 8-9, 1958 - Continued								
			5:42p	.20	1.12	6:18p	.007	.0464
			:44	3.00	1.22	:28	.0021	.0471
			:50	.20	1.24	:38	.0013	.0473
			6:00	.06	1.25	:42	.0021	.0474
			ceased	-	-	:43	.0040	.0475
			6:09	0	1.25	:47	.007	.0478
			:13	1.50	1.35	:53	.0040	.0484
			:19	.30	1.38	7:07	.0006	.0489
			:34	.24	1.40	:53	.0006	.0492
			:37	1.20	1.46	:56	.022	.0497
			:54	2.70	1.55	:57	.044	.0502
			7:00	.03	1.56	8:00	.074	.0532
			:00	.02	1.57	:02	.119	.0564
			:00	.18	1.60	:03	.175	.0588
			:03	.80	1.64	:04	.219	.0621
			:07	.15	1.65	:08	.277	.0786
			:10	2.00	1.75	:13	.219	.0993
			:14	2.25	1.90	:17	.175	.1124
			:18	1.50	2.00	:21	.142	.1230
			8:00	.60	2.02	:25	.103	.1317
			:03	.60	2.05	:29	.074	.1370
			:06	1.40	2.12	:35	.051	.1433
			:10	.08	2.15	:42	.032	.1481
			:15	.12	2.19	:48	.022	.1508
			8:00	.06	2.20	:58	.010	.1534
			:07	.07	2.23	9:08	.0040	.1546
			:11	.30	2.26	:24	.0006	.1552
			1:00	.20	2.35	10:20	.0002	.1555
			:12	.15	2.38	12:00m	0	.1557
			:20	.28	2.39			
			:30	.30	2.44			
			:45	.12	2.47			
			11:00	.08	2.49			
			12:00m	.01	2.50			
			7-9-58					
			12:30a	.04	2.52			
			:50	.09	2.55			

Notes: To convert runoff in in/hr to cfs multiply by 3.549

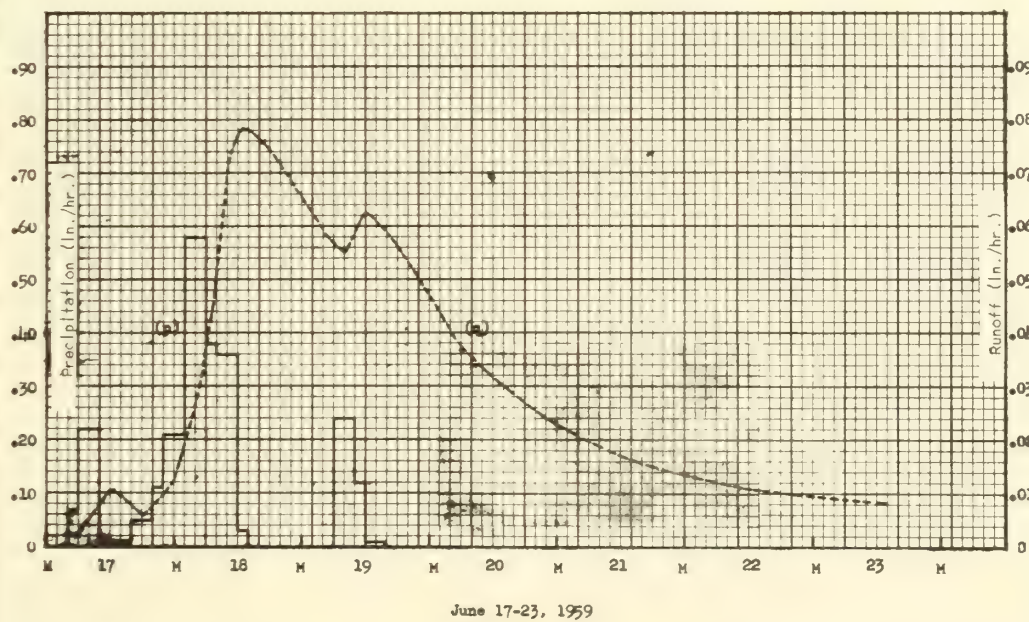
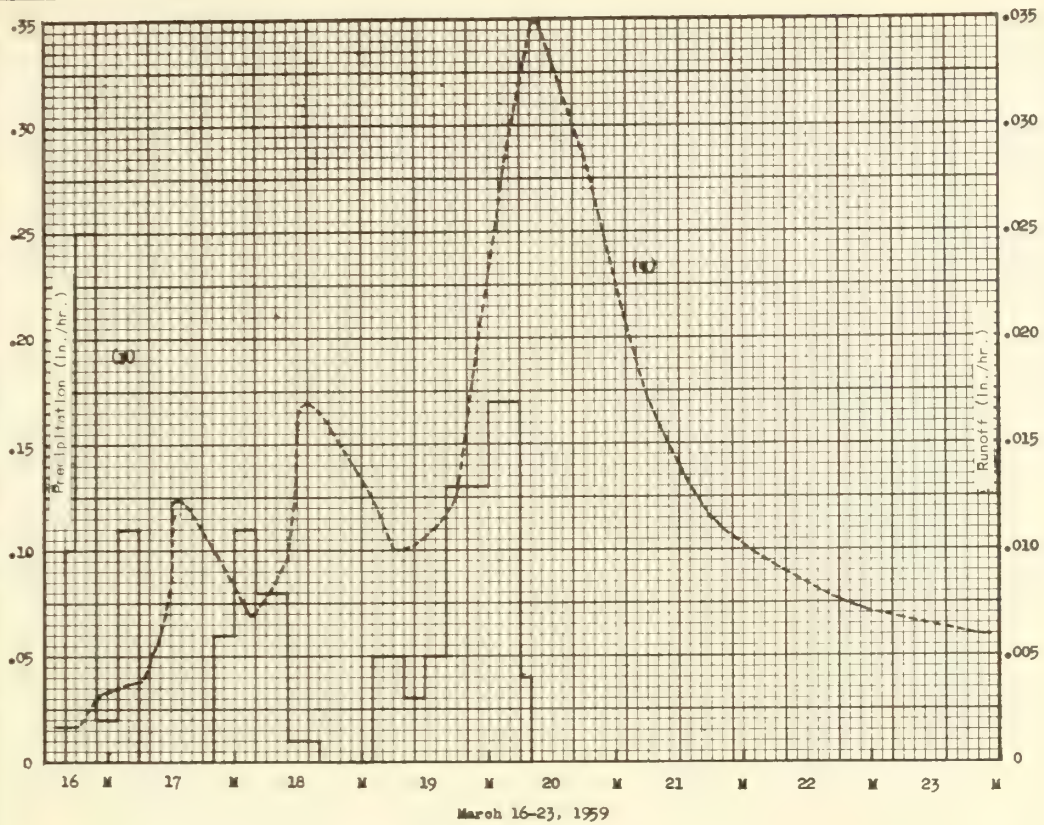


COLLEGE PARK, MARYLAND WATERSHED W-7



MONTHLY PRECIPITATION AND RUNOFF (Inches)									Vero Beach, Florida Watershed W-1 Area 49,915 ac. (78.0 sq. mi.)							
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	0.44 .68	2.58 .79	0.15 .76	3.71 1.04	1.32 .66	3.30 .69	6.03 1.58	5.70 1.24	9.39 5.04	11.29 8.95	0.74 1.35	0.45 1.06	49.10 23.82			
1957 P Q	4.30 2.01	4.54 1.74	4.13 2.44	5.56 2.44	6.34 2.41	4.02 1.44	4.11 1.35	8.35 2.55	6.30 3.71	5.11 3.21	.90 1.07	2.43 1.00	56.59 25.07			
1958 P Q	7.32 3.40	1.57 1.46	4.33 1.64	3.48 1.56	3.64 1.22	5.09 1.45	4.07 1.41	3.05 1.02	5.20 1.09	2.39 .83	1.64 .90	3.42 1.07	45.30 17.15			
1959 P	2.32 1.17	.70 .88	8.68 3.42	2.83 1.49	5.60 1.73	11.69 6.47	7.05 3.60	5.25 2.35	8.65 3.94	6.55 4.05	3.04 1.89	1.56 1.31	63.90 32.30			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS									Vero Beach, Florida Watershed W-1							
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	10-2	.731	10-2	.031	10-2	.060	10-2	.178	10-3	.334	10-3	.478	10-2	.838	9-30	1.88
1958	1-24	.029	1-24	.029	1-24	.056	1-24	.159	1-24	.296	1-24	.452	1-24	.679	1-21	1.58
1959	6-18	.073	6-18	.078	6-18	.155	6-18	.459	6-18	.833	6-18	1.41	6-18	2.79	6-18	4.94
Notes: Quality of records: monthly P and Q, good. Annual maximum discharge and volumes, good. Watershed conditions, (1958) Citrus, 28%, improved pasture- 10%, range and forest-50%, miscellaneous-15%. Monthly precipitation Thiessen weighted average of rain-gages.																
SELECTED RUNOFF EVENTS									Vero Beach, Florida Watershed W-1							
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
2-14-59	0	0.030	3-16-59	(5 Rain-gages)		3-16-59										
2-15	0	.033	4:00p	0	0	6:00p	0.0016									
2-16	0	.033	6:00	.10	.20	12:00m	.0034									
2-17	.16	.030	10:00	.25	1.20	3-17-59										
2-18	0	.029	3-17-59			6:00a	.0037	.0363								
2-19	0	.029	2:00a	.02	1.28	12:00n	.0039									
2-20	0	.025	6:00	.11	1.72	1:00p	.0124	.0847								
2-21	0	.022	8:00p	.00	1.72	2:00	.0124									
2-22	0	.023	12:00m	.06	1.96	3-13-59										
2-23	0	.028	3-18-59			3:00a	.0069	.2225								
2-24	0	.029	4:00a	.11	2.40	10:00	.0097	.2806								
2-25	0	.031	10:00	.08	2.88	12:00n	.0136	.3059								
2-26	.16	.030	4:00p	.01	2.94	2:00p	.0170	.3385								
2-27	.15	.036	3-19-59			6:00	.0136	.4037								
2-28	1.07	.054	2:00a	.00	2.94	3-19-59										
3-1	.30	.120	8:00	.05	3.24	6:00a	.0101	.5579								
3-2	.01	.040	12:00n	.03	3.35	12:00n	.0106	.6200								
3-3	.01	.031	4:00p	.05	3.55	6:00p	.0129	.6905								
3-4	.01	.032	12:00m	.15	4.60	3-20-59										
3-5	.01	.031	3-20-59			3:00a	.0278	.8737								
3-6	.02	.032	6:00a	.17	5.62	9:00	.0349	1.062								
3-7	0	.034	8:00	.04	5.70	6:00p	.0285									
3-8	.19	.035				3-21-59										
3-9	.29	.036				6:00a	.0172	1.621								
3-10	0	.036				6:00p	.0115									
3-11	0	.037				3-22-59										
3-12	.53	.039				6:00p	.0076	2.022								
3-13	0	.044				3-23-59										
3-14	0	.047				10:00p 1/	.0060	2.212								
3-15	0	.044														
3-16	0	.036 2/														
Notes: To convert runoff in in/hr to cfs, multiply by 50332. All precipitation Thiessen weighted. For map of watershed see Selected Runoff Events for Small Agricultural Watersheds in the U. S., ARS, SMC, January 1960, page 8.1-7. Runoff continued at rate less than 0.01 in/hr until next event. 2/ Runoff prior to 6:00p.																

SELECTED RUNOFF EVENTS						Vero Beach, Florida Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 17-23, 1959								
5-18-59	0.24	0.080	6-17-59	(5 Rainages)		6-17-59		
5-19	.02	.082	4:00a	0	0	6:00a	0.0022	0
5-20	0	.051	6:00	.07	.14	12:00n	.0101	.0369
5-21	.07	.034	10:00	.22	1.02	6:00p	.0063	.0861
5-22	.01	.045	4:00p	.01	1.03	12:00m	.0122	.1416
5-23	.01	.052	8:00	.05	1.28	6-18-59		
5-24	0	.049	10:00	.11	1.50	6:00a	.0372	.2398
5-25	.06	.041	6-18-59			12:00n	.0771	.6327
5-26	0	.039	2:00a	.21	2.34	1:00p	.0781	.7103
5-27	0	.038	6:00	.58	4.66	6:00	.0747	1.092
5-28	1.59	.064	8:00	.38	5.42	6-19-59		
5-29	.02	.140	12:00n	.36	6.36	6:00a	.0574	1.835
5-30	0	.075	2:00p	.03	6.92	8:00	.0553	1.998
5-31	0	.057	6-19-59			12:00n	.0620	2.234
6-1	.13	.046	6:00a	.00	6.92	6:00p	.0565	2.590
6-2	.04	.042	10:00	.24	7.88	6-20-59		
6-3	.82	.042	12:00n	.12	8.12	6:00a	.0375	3.154
6-4	.08	.090	4:00p	.01	8.16	12:00m	.0226	3.695
6-5	.46	.108				6-21-59		
6-6	.16	.101				6:00p	.0149	4.033
6-7	.17	.112				6-22-59		
6-8	.03	.052				12:00n	.0114	4.270
6-9	0	.045				6-23-59		
6-10	0	.051				2:00p 1/	.0082	4.525
6-11	0	.054						
6-12	0	.047						
6-13	.04	.041						
6-14	.51	.040						
6-15	.20	.066						
6-16	.76	.054						
6-17	0	.032 2/						
Watershed Conditions: Citrus 34%; range and forest 34%; miscellaneous roads, canals, cities, etc. 22%; and improved pasture 10%. (Approximate figures from SCS).								
Notes: To convert runoff in in/hr to cfs, multiply by 50332. 1/ Runoff continued at rate less than 0.01 in/hr until next event. 2/ Runoff prior to 6:00a.								



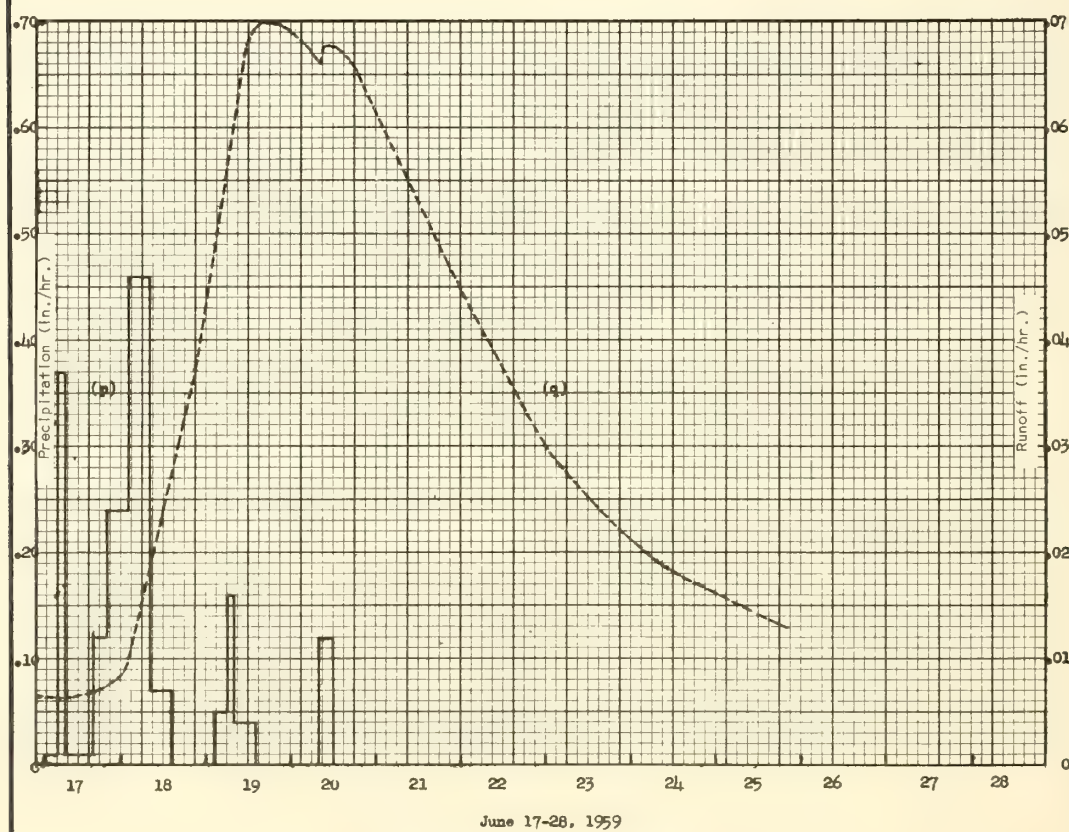
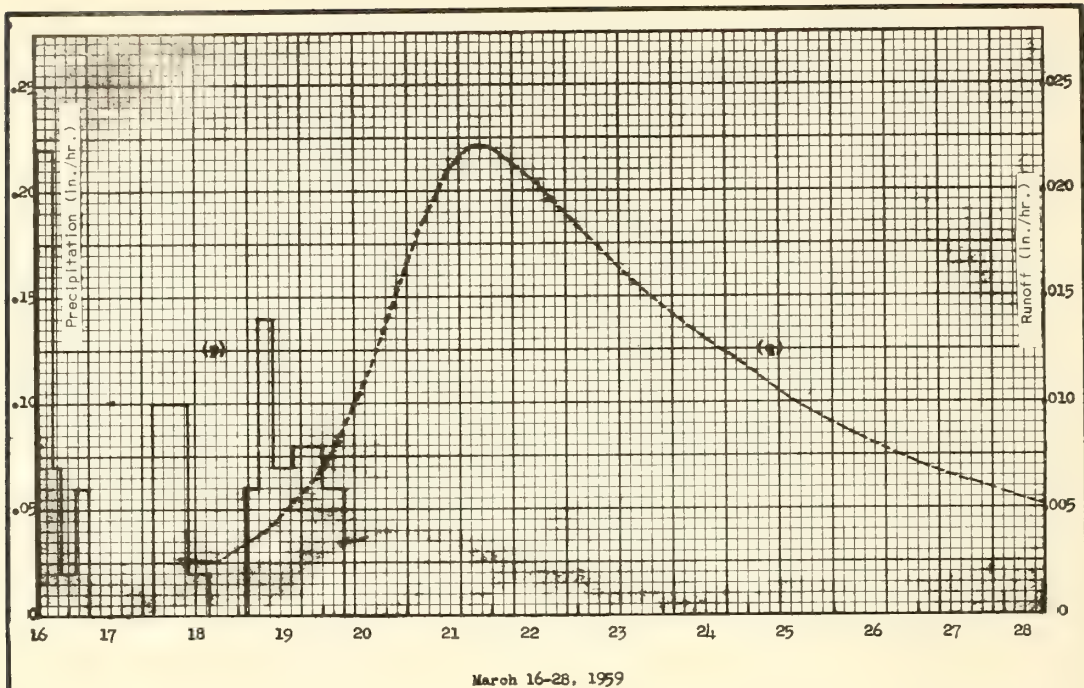
VERO BEACH, FLORIDA, WATERSHED W-1



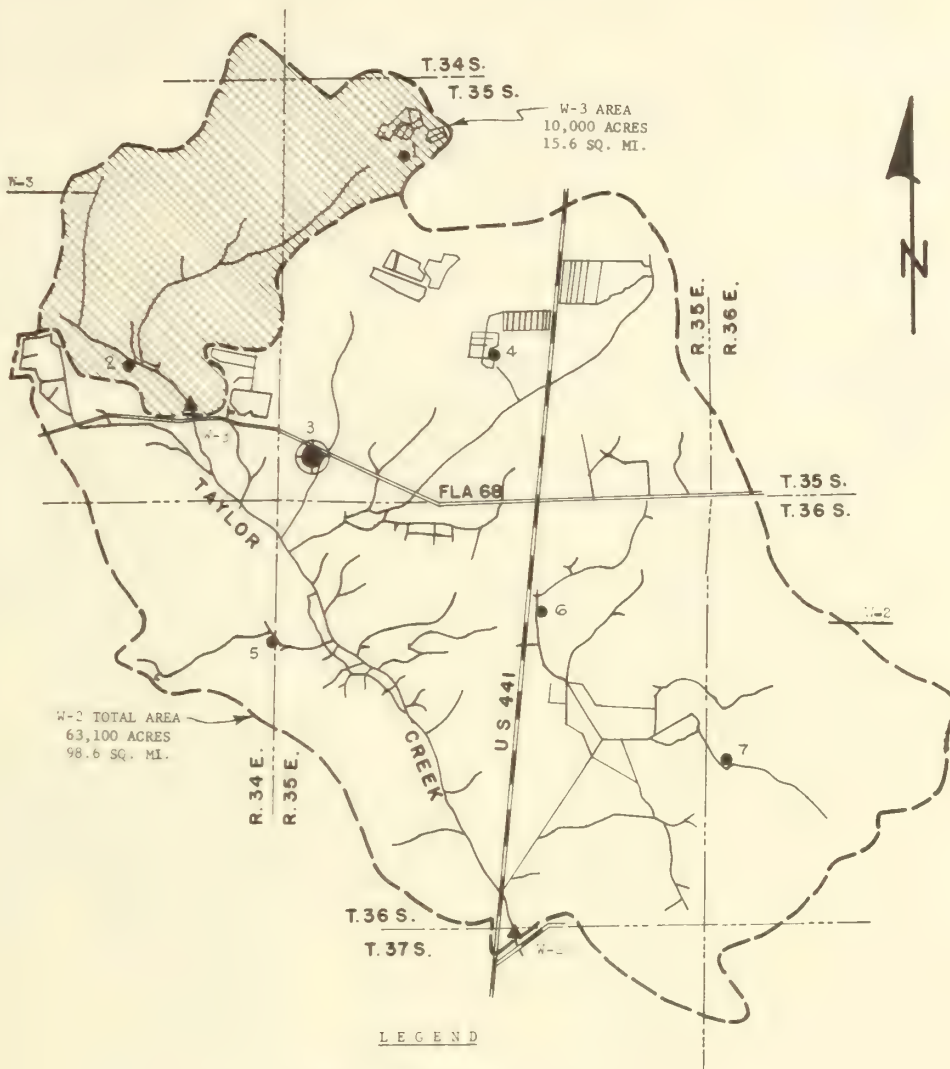
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Vero Beach, Florida Watershed W-2 1/ Area 63,100 ac. (98.6 sq. mi.)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	0.25 .04	0.79 .01	1.63 .01	4.28 0	5.71 .66	5.53 .28	4.13 .30	4.88 .02	8.45 2.63	12.21 9.78	0.18 .22	0.36 .40	49.40 14.35			
1957 P Q	1.52 .06	3.76 .07	4.31 .71	5.61 .91	7.38 2.24	4.91 1.48	7.00 2.48	9.12 5.26	10.62 6.37	1.20 1.45	.45 .09	4.15 .26	60.03 21.33			
1958 P Q	6.06 2.50	1.01 .46	6.08 1.89	1.79 .44	3.80 .17	5.27 .09	6.82 2.16	7.40 1.73	5.24 1.19	3.46 .49	.44 .14	2.62 .13	49.99 11.39			
1959 P Q	3.26 .48	.71 .30	7.48 3.30	2.11 .32	5.49 .16	12.49 9.31	6.12 1.42	3.81 .75	6.38 2.75	8.55 4.56	3.33 1.92	1.45 .40	61.18 25.68			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Vero Beach, Florida Watershed W-2								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	9-8	.015	9-8	.015	9-8	.030	9-8	.090	9-8	.180	9-8	.340	9-7	.669	9-5	2.19
1958	1-26	.013	1-26	.013	1-26	.026	1-26	.076	1-26	.148	1-26	.293	1-26	.558	1-24	1.60
1959	6-19	.070	6-19	.070	6-19	.139	6-19	.412	6-19	.810	6-20	1.60	6-19	3.08	6-18	7.16
Notes: Quality of records: monthly P and Q, good. Annual maximum discharge and volumes, good. Watershed conditions, (1958) Improved pasture-10%, semi-improved-10%, unimproved-45%, range and forest-20%, miscellaneous-15%. Monthly precipitation Thiessen weighted using 7 raingages. 1/ Upper Taylor Creek.																
SELECTED RUNOFF EVENTS								Vero Beach, Florida Watershed W-2								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)		Runoff (inches)		Date and time	Intensity (in/hr)		Acc. (inches)		Date and time		Rate (in/hr)		Acc. (inches)		
Event of March 16-28, 1959																
2-15-59	0.01		.006		3-16-69	(7 Raingages)				3-18-59						
2-16	.01		.006		4:00p	0		0		6:00p		.0025		0		
2-17	.07		.006		8:00	.22		.88		3-19-59						
2-18	0		.005		10:00	.07		1.02		12:00n		.0046		.0639		
2-19	0		.005		3-17-59					3-20-59						
2-20	0		.004		2:00a	.02		1.10		6:00a		.0086		.1827		
2-21	0		.004		6:00	.06		1.54		12:00n		.0164		.4077		
2-22	0		.004		12:00m	.00		1.54		3-21-59						
2-23	0		.004		3-18-59					12:00n		.0209		.6315		
2-24	0		.003		10:00a	.10		2.54		9:00p		.0221		.8250		
2-25	0		.003		4:00p	.02		2.46		3-22-59						
2-26	0		.003		3-19-59					12:00n		.0206		1.145		
2-27	.25		.005		2:00a	.00		2.46		3-23-59						
2-28	1.43		.004		6:00	.06		2.70		6:00a		.0175		1.488		
3-1	.39		.014		10:00	.14		3.26		12:00n		.0146		1.777		
3-2	0		.027		4:00p	.07		3.68		3-24-59						
3-3	0		.027		12:00p	.08		4.52		6:00p		.0122		2.018		
3-4	0		.025		3-20-59					3-25-59						
3-5	0		.023		6:00a	.06		4.68		12:00n		.0102		2.220		
3-6	.02		.022							3-26-59						
3-7	0		.020							6:00a		.0086		2.389		
3-8	.11		.018							12:00n		.0072		2.531		
3-9	.17		.017							3-27-59						
3-10	0		.015							6:00p		.0061		2.651		
3-11	0		.012							3-28-59						
3-12	.18		.009							12:00n 1/		.0051		2.752		
3-13	.01		.008													
3-14	0		.007													
3-15	0		.006													
3-16	0		.003 2/													
Watershed Conditions: Same as for event of June 17-25, 1959.																
Notes: To convert runoff in in/hr to cfs, multiply by 63857. All precipitation Thiessen weighted 1/ Runoff continued at rate less than 0.01 in/hr until next event. 2/ Runoff negligible to 6:00p, 3-18-59.																



SELECTED RUNOFF EVENTS			Vero Beach, Florida Watershed W-2					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 17-25, 1952								
5-18-52	0.08	0.002	6-17-59	( 7 Rain gauges)		6-17-59		
5-19	1.11	.002	2:00a	0	0	6:00a	0.0061	0
5-20	.10	.003	6:00	.01	.01	10:00p	.0079	.1120
5-21	.13	.005	8:00	.37	.78	6-18-59		
5-22	.07	.005	4:00p	.01	.76	2:00a	.0092	.1462
5-23	.04	.005	8:00	.12	1.34	12:00n	.0226	.3052
5-24	0	.005	6-18-59			10:00p	.0370	.6032
5-25	0	.004	2:00a	.01	2.73	6-19-59		
5-26	0	.004	8:00	.14	5.01	12:00n	.0679	1.33
5-27	0	.004	2:00p	.07	5.96	5:00p	.0700	1.683
5-28	2.13	.003	6-19-59			6-20-59		
5-29	.11	.021	2:00a	.03	7.00	6:00a	.0673	2.575
5-30	0	.021	6:00	.05	7.15	10:00p	.0658	2.775
5-31	0	.027	8:00	.16	7.41	12:00n	.0673	2.841
6-1	0	.027	2:00p	.01	7.42	12:00n	.0676	2.976
6-2	0	.032	6-20-59			6:00p	.0658	3.376
6-3	.02	.037	1:00a		6.72	6-21-59		
6-4	.10	.030	12:00n	.11	7.00	1:00p	.0150	5.038
6-5	0	.035				6-22-59		
6-6	.03	.021				12:00m	.0300	5.938
6-7	1.00	.028				6-23-59		
6-8	.02	.037				6:00a	.0135	6.680
6-9	0	.041				6-25-59		
6-10	0	.117				6:00p 1/	.0135	7.274
6-11	0	.117						
6-12	0	.115						
6-13	0	.110						
6-14	1.54	.093						
6-15	.02	.135						
6-16	.02	.11						
6-17	0	.11						
Watershed Conditions: Unimproved pasture 17%; improved pasture 44%; nonforest wooded areas, woods, etc. 14%; and water and forest 14%. Approximate figures from SCS).								
Notes: To convert runoff in in/hr to cfs, multiply by .03357. 1/ runoff continued at rate less than 0.01 in/hr until next event. 2/ Runoff prior to 6:00a.								

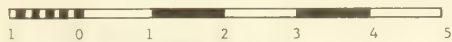


VERO BEACH, FLORIDA, WATERSHED W-2



#### LEGEND

- 2 ● - RAINGAGE AND GROUNDWATER STAGE RECORDER
- ▲ - RUNOFF GAGING STATION
- ⊙ - EVAPORATION PAN, RAINGAGE, GROUNDWATER STAGE RECORDER
- ▨ - SUB-AREA (WATERSHED W-3), VERO BEACH, FLORIDA
- - STREAMS AND CANALS
- - HIGHWAYS



SCALE IN MILES

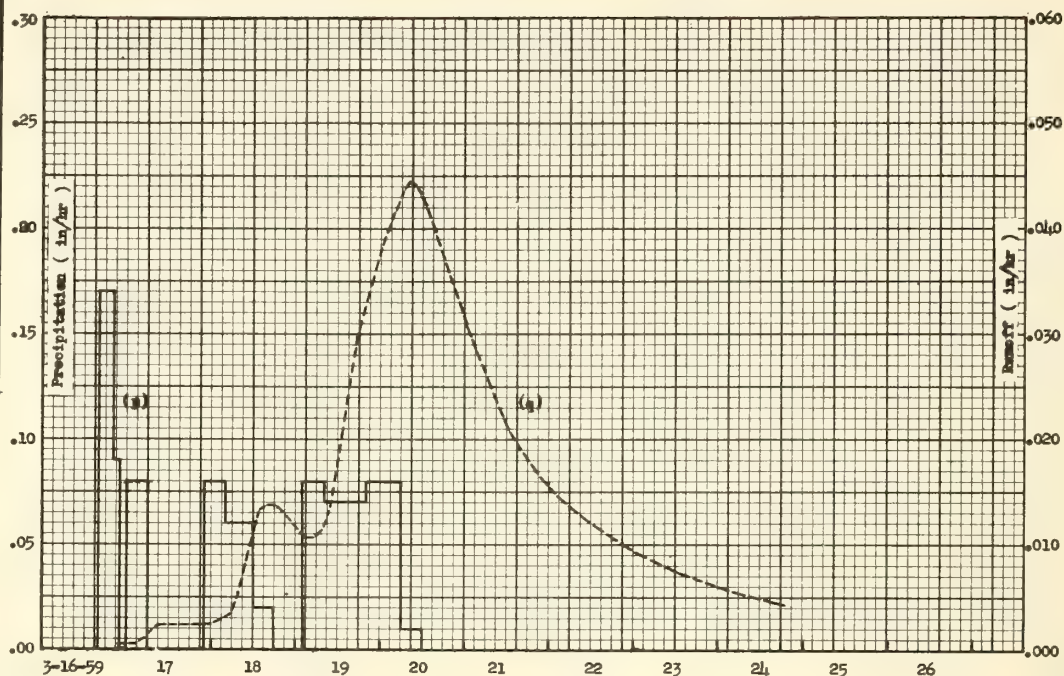
ELEVATION - 25 TO 70 FEET (MSL)

VERO BEACH, FLORIDA  
WATERSHEDS W-2 AND W-3  
UPPER TAYLOR CREEK  
(OKEECHOBEE COUNTY, FLORIDA)

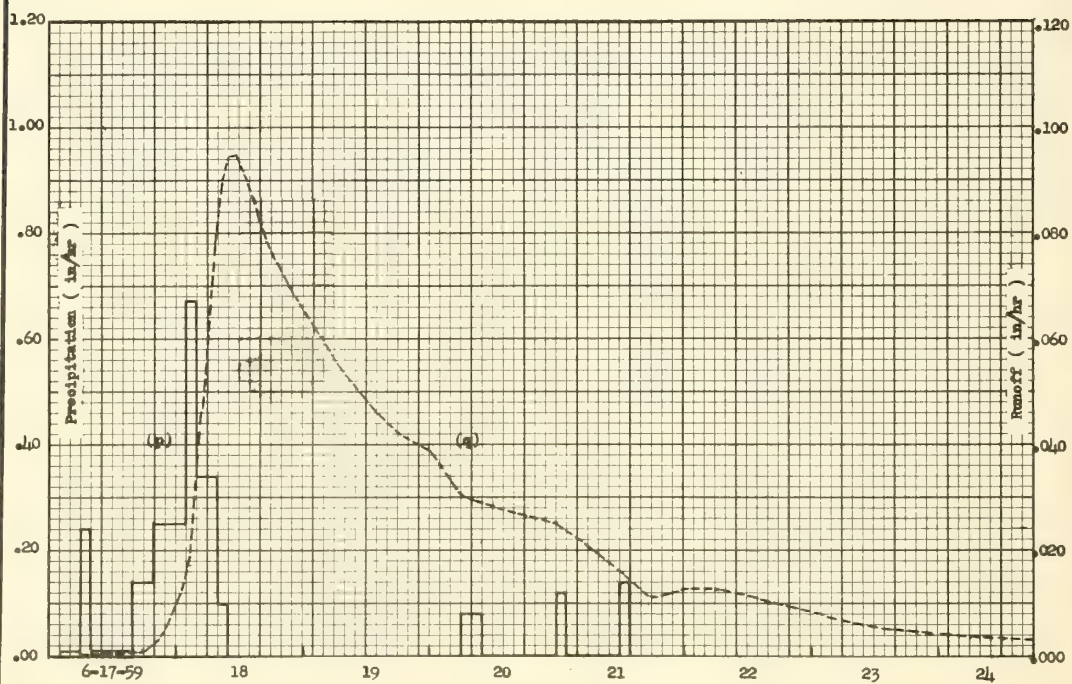


MONTHLY PRECIPITATION AND RUNOFF (Inches)								Vero Beach, Florida Watershed W-3 1/ Area 10,000 ac. (15.6 sq. mi.)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956	P 0.39 Q .04	1.04 .02	1.11 .01	6.20 .16	3.91 1.14	4.77 .04	2.72 .05	6.63 .09	8.28 3.30	13.50 9.19	0.12 .08	0.11 .02	48.78 14.14			
1957	P 1.42 Q .04	2.90 .04	6.27 .55	5.95 .85	6.45 .78	3.70 .90	7.05 1.12	8.53 3.43	8.57 5.45	1.64 .95	.26 .01	3.67 .16	56.41 11.28			
1958	P 5.88 Q 2.27	1.23 .29	6.39 2.10	2.71 .62	3.40 .17	7.34 .08	5.74 1.59	7.26 .85	4.68 .76	3.54 .59	.58 .06	2.49 .07	51.24 9.45			
1959	P 3.37 Q .48	1.11 .17	7.35 3.35	1.78 .17	5.41 .45	9.21 5.28	3.46 .16	4.47 .39	4.56 .41	9.12 6.10	2.64 .59	1.85 .44	54.33 17.99			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Vero Beach, Florida Watershed W-3								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	9-17	.058	9-17	.058	9-17	.116	9-17	.336	9-17	.633	9-17	1.09	9-16	1.63	9-15	3.16
1958	1-24	.029	1-24	.029	1-24	.057	1-24	.166	1-24	.320	1-24	.559	1-24	.852	1-22	1.65
1959	6-18	.094	6-18	.094	6-18	.183	6-18	.538	6-18	.998	6-18	1.70	6-18	2.97	6-18	4.57
Notes: Quality of records: monthly P and Q, good. Annual maximum discharge and volumes, good. Watershed conditions, (1958) Improved pasture-10%, semi-improved-10%, unimproved-45%, range and forest-20%, miscellaneous-15%. Monthly precipitation Thiessen weighted using 2 raingages. 1/ Sub-area of Upper Taylor Creek.																
SELECTED RUNOFF EVENTS								Vero Beach, Florida Watershed W-3								
Antecedent conditions					Rainfall					Runoff						
Date	Rainfall (inches)		Runoff (inches)		Date and time		Intensity (in/hr)		Acc. (inches)		Date and time		Rate (in/hr)		Acc. (inches)	
Event of March 16-24, 1959																
2-14-59	0		0.005		3-16-59	(2 Raingages)					3-16-59					
2-15	0		.004		4:00p		0		0		6:00p		0.0003		0	
2-16	0		.004		8:00		.17		.68		3-17-59					
2-17	.04		.004		10:00		.09		.86		3:00a		.0007		.0045	
2-18	0		.004		12:00		.00		.86		9:00		.0021		.0129	
2-19	0		.003		3-17-59						12:00m		.0026		.0481	
2-20	0		.003		6:00a		.08		1.34		3-18-59					
2-21	0		.003		10:00p		.00		1.34		6:00a		.0038		.0673	
2-22	0		.003		3-18-59						3:00p		.0157		.1461	
2-23	0		.002		4:00a		.08		1.82		3-19-59					
2-24	0		.002		12:00		.06		2.30		3:00a		.0109		.2937	
2-25	0		.002		6:00p		.02		2.42		8:00		.0116		.3499	
2-26	0		.002		3-19-59						6:00p		.0298		.5569	
2-27	.39		.002		2:00a		.00		2.42		12:00m		.0378		.7597	
2-28	1.10		.005		8:00		.08		2.90		3-20-59					
3-1	.58		.064		8:00p		.07		3.74		6:00a		.0430		1.002	
3-2	0		.055		3-20-59						8:00		.0441		1.089	
3-3	0		.036		6:00a		.08		4.54		12:00		.0423		1.262	
3-4	0		.023		12:00m		.01		4.60		12:00m		.0316		1.705	
3-5	0		.015								3-21-59					
3-6	.02		.011								12:00m		.0212		2.022	
3-7	0		.009								12:00m		.0155		2.242	
3-8	.16		.007								3-22-59					
3-9	.11		.039								6:00p		.0102		2.4174	
3-10	0		.007								3-23-59					
3-11	0		.006								12:00m		.0078		2.636	
3-12	.72		.008								3-24-59					
3-13	0		.017								6:00p 1/		.0042		2.816	
3-14	0		.011													
3-15	0		.008 2/													
Watershed Conditions: Same as for event of June 17-24, 1959.																
Notes: To convert runoff in in/hr, multiply by 10081. All precipitation Thiessen weighted.																
1/ Runoff continued at rate less than 0.01 in/hr. until next event. 2/ Runoff negligible to 6:00p, 3-16-59.																
See map page 8.2-4																

SELECTED RUNOFF EVENTS						Vero Beach, Florida Watershed W-3		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 17-24, 1959								
5-18-59	0.13	0	6-17-59	(2 Rainages)		6-17-59		
5-19	.22		2:00a	0	0	6:00a	0.0005	0
5-20	.11	.001	6:00	.01	.04	6:00p	.0010	.0090
5-21	.14	.001	8:00	.24	.52	9:00	.0034	.0156
5-22	.14	.006	4:00p	.01	.60	12:00	.0091	.0344
5-23	1.35	.006	8:00	.14	1.16	6-18-59		
5-24	0	.038	6-18-59			3:00a	.0185	.0758
5-25	0	.029	2:00a	.25	2.66	8:00	.0788	.3190
5-26	0	.020	4:00	.67	4.00	9:00	.0880	.4024
5-27	0	.012	8:00	.34	5.36	11:00	.0941	.5845
5-28	2.38	.026	10:00	.10	5.56	5:00p	.0782	1.101
5-29	.12	.136	6-20-59			6-19-59		
5-30	0	.100	6:00a	.00	5.56	6:00a	.0562	1.975
5-31	0	.069	10:00a	.08	5.38	6:00	.0421	2.565
6-1	0	.048	12:00m	.00	5.88	12:00m	.0398	2.811
6-2	0	.033	6-21-59			6-20-59		
6-3	0	.024	2:00a	.12	6.12	6:00a	.0302	3.021
6-4	.36	.016	12:00m	.00	6.12	12:00m	.0258	3.525
6-5	0	.010	2:00p	.14	6.40	6-21-59		
6-6	.25	.008				6:00p	.0119	3.864
6-7	1.34	.043				12:00m	.0126	3.938
6-8	.15	.155				6-22-59		
6-9	0	.076				6:00a	.0124	4.013
6-10	0	.038				6-23-59		
6-11	0	.024				12:00m	.0059	4.287
6-12	0	.014				6-24-59		
6-13	0	.009				6:00p 1/	.0031	4.422
6-14	.45	.007						
6-15	.17	.011						
6-16	.22	.013						
6-17		.009						
Watershed Conditions: Improved pasture 70%; range and forest 20%; unimproved pasture 15%; and mi- cellaneous roads, canals, cities, etc. 15%. (Approximate values from SCS).								
Notes: To convert runoff in in/hr to cfs, multiply by 10081. 1/ Runoff continued at rate less than 0.01 in/hr until next event. 2/ Runoff prior to 6:00a.								



March 16-24, 1959



June 17-25, 1959

VERO BEACH, FLORIDA, WATERSHED W-3



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Watkinsville, Georgia Watershed W-1 (Area - 19.2 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P	2.21	5.68	5.95	6.01	1.56	3.22	5.09	0.56	6.22	2.66	2.02	3.84	45.02			
Q	0	T	.19	.06	0	0	T	0	.02	0	0	0	.27			
1957 P	4.94	3.36	4.12	4.03	5.78	2.78	3.26	1.08	5.58	3.92	8.19	3.40	50.44			
Q	T	T	T	.10	.05	.04	.02	0	T	.01	.74	T	.96			
1958 P	3.74	4.76	6.21	5.05	2.88	1.08	5.68	3.70	1.29	.72	1.39	3.04	39.54			
Q	.01	.03	.03	.02	0	0	.01	.42	0	0	0	0	.52			
1959 P	2.65	5.14	6.15	2.08	6.88	2.94	6.40	1.42	2.85	6.08	2.08	2.86	47.53			
Q	.04	.30	.27	.13	.41	.21	.16	0	T	T	T	T	1.52			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Watkinsville, Georgia Watershed W-1								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	11-19	.77	11-19	0.36	11-19	0.46	11-18	0.53	11-18	0.53	11-18	0.53	11-18	0.53	11-18	0.74
1958	8-13	1.42	8-13	.43	8-13	.43	8-13	.43	8-13	.43	8-13	.43	8-13	.43	8-13	.43
1959	5-30	.40	5-30	.12	5-30	.14	5-30	.16	2-12	.21	2-12	.26	5-30	.34	5-30	.54
Notes: Quality of records: all excellent except July 1959 which is fair. Cropping and management history: Watershed used for pasture; 1956, Kudzu-rescue grass; 1957, Kudzu pasture, bench terraces removed and field smoothed in fall and rye planted; 1958, rye for silage then Coastal Bermuda; 1959, Coastal Bermuda. Overall fertility level high (approx. 1000 lb. ac 6-12-12 + 160 lb. N annually).																
SELECTED RUNOFF EVENTS								Watkinsville, Georgia Watershed W-1								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)		Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)		Acc. (inches)						
Event of July 11, 1941																
6-11-41	0.03		0	7-11-41	Raingage	R1-W1	7-11-41									
6-12	.09		0	10:35a	0	0	10:36a	0		0						
6-13	.12		0	:40	2.76	.23	:38	.0076		.0001						
6-14	.06		0	:45	1.80	.38	:40	.0041		.0003						
6-16	.06		0	:47	.90	.41	:43	.0215		.0009						
6-22	.12		0	:57	.12	.43	:44	.0513		.0015						
6-23	1.73		.0656	11:00	1.00	.48	:45	.0565		.0024						
6-24	.22		0	:05	1.08	.57	:46	.0510		.0033						
6-25	.66		.0968	:10	2.52	.78	:48	.0503		.0050						
6-26	.47		.1483	:12	5.40	.96	:50	.0616		.0069						
7-1	.34		.0142	:15	5.00	1.21	:53	.0981		.0109						
7-3	.26		.0045	:20	2.40	1.41	:56	.1225		.0164						
7-4	.02		0	:25	3.12	1.67	:59	.1169		.0224						
7-5	1.19		.3085	:30	2.40	1.87	11:02	.1141		.0282						
7-6	2.27		1.0487	:35	.96	1.95	:07	.1121		.0376						
7-8	.06		0	:39	1.80	2.07	:09	.1410		.0418						
				:49	.54	2.16	:11	.2041		.0476						
				:55	1.60	2.32	:13	.3213		.0564						
Watershed Conditions: Broadcast cowpeas 4-6 inches high; surface hard and settled. Cowpeas part of a cowpea-cotton cropping system on this watershed.				12:00n	.84	2.39	:14	.436		.0627						
				:10	.42	2.46	:15	.557		.0710						
				1:10	.01	2.47	:16	.655		.0811						
				2:10	.01	2.48	:17	.736		.0927						
				3:10	.01	2.49	:18	.873		.1061						
				3:40	.02	2.50	:19	1.011		.1218						
							:20	1.165		.1399						
							:21	1.305		.1605						
							:22	1.408		.1831						
							:23	1.513		.2074						
							:24	1.663		.2338						
							:25	1.778		.2624						
Notes: To convert runoff in in/hr to cfs multiply by 19.3599																

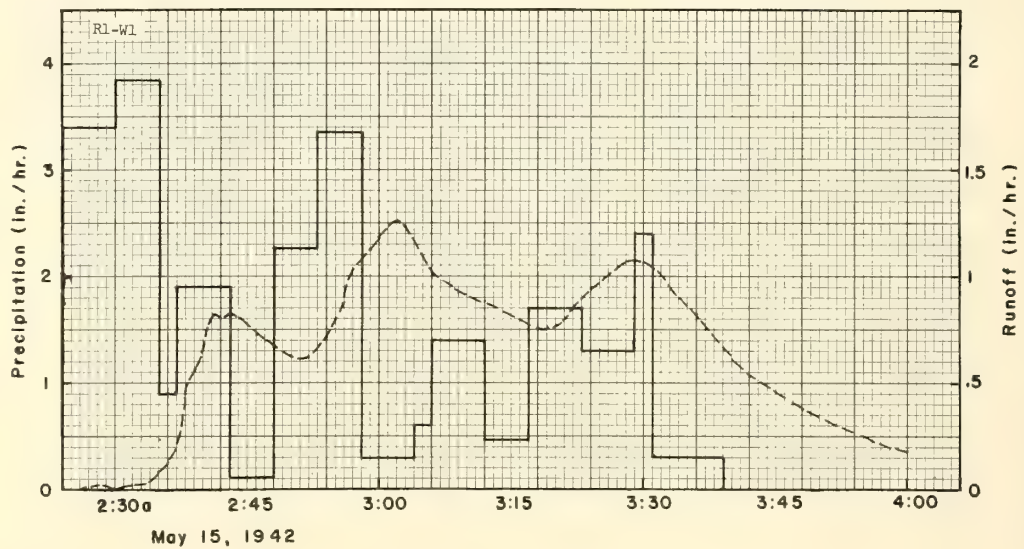
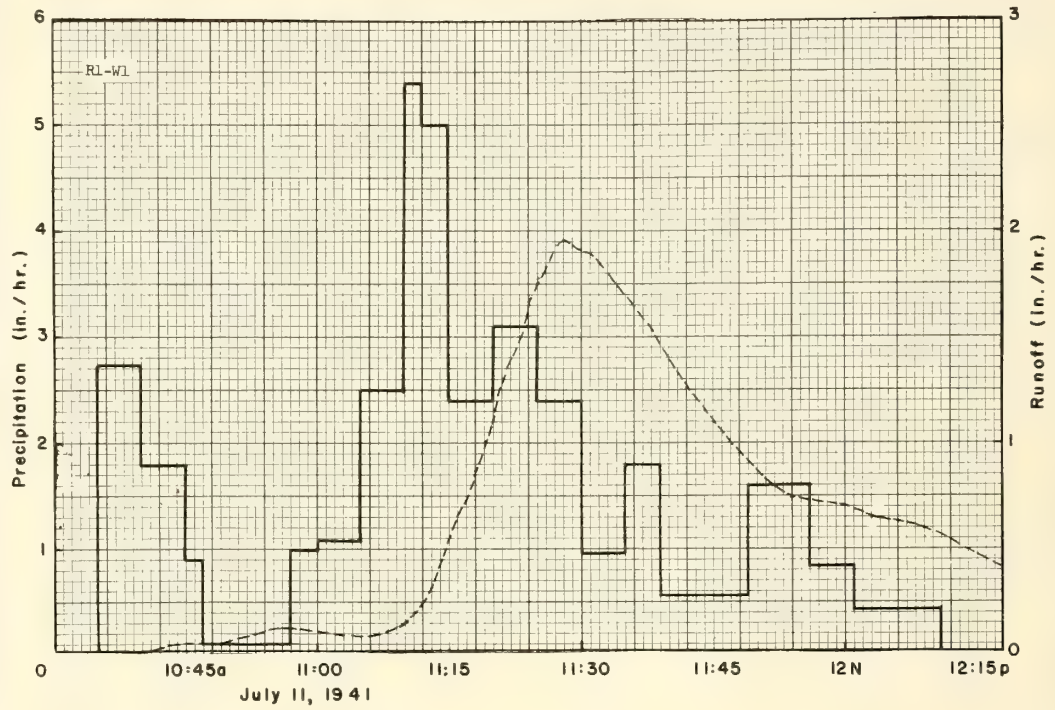
SELECTED RUNOFF EVENTS						Watkinsville, Georgia Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 11, 1941 - Continued								
						:26a	1.838	.2925
						:27	1.936	.3239
						:28	1.960	.3564
						:29	1.944	.3889
						:30	1.932	.4212
						:31	1.888	.4530
						:32	1.853	.4842
						:33	1.790	.5146
						:34	1.744	.5440
						:36	1.630	.6002
						:38	1.528	.6528
						:40	1.394	.7015
						:42	1.262	.7457
						:45	1.103	.8049
						:48	.956	.8564
						:51	.830	.9010
						:54	.750	.9405
						:57	.719	.9772
						12:00n	.708	1.0129
						:03	.653	1.0469
						:09	.604	1.1097
						:15	.468	1.1633
						:21	.338	1.2036
						:27	.236	1.2323
						:33	.174	1.2528
						:39	.127	1.2678
						:45	.092	1.2788
						:51	.0687	1.2868
						:57	.0527	1.2929
						1:03p	.0416	1.2976
						1:09	.0317	1.3013
						:21	.0211	1.3066
						:33	.0150	1.3102
						:45	.0102	1.3127
						2:05	.0063	1.3154
						:25	.0034	1.3170
						:45	.0022	1.3179
						3:05	.0012	1.3185
						:25	.0007	1.3188
						:45	.0003	1.3190
						4:05	0	1.3191
Event of May 15, 1942								
5-4-42	.28	0	5-15-42	Raingage	R1-W1	5-15-42		
5-5	.02	0	2:24a	0	0	2:26a	0	0
5-6	.02	0	:30	3.40	.34	:28	.023	.0004
5-7	.02	0	:35	3.84	.66	:29	.022	.0008
5-12	.14	0	:37	.90	.69	:30	.008	.0011
5-13	1.18	T	:43	1.90	.88	:32	.018	.0015
5-14	1.16	.01	:48	.12	.89	:34	.044	.0025
			:53	2.28	1.08	:35	.078	.0035
			:58	3.36	1.36	:36	.116	.0051
			3:04	.30	1.39	:37	.225	.0079
			:06	.60	1.41	:38	.431	.0134
			:12	1.40	1.55	:39	.567	.0217
			:17	.48	1.59	:40	.683	.0321
			:23	1.70	1.76	:41	.820	.0446
			:29	1.30	1.89	:42	.802	.0581
			:31	2.40	1.97	:43	.816	.0716
			:35	.30	1.99	:44	.778	.0849
						:45	.775	.0979
						:46	.718	.1103
						:47	.702	.1221
Watershed Conditions: Cotton 2-3 inches high, soil loose and without vegetative cover. Fair stand. Rows on contour between bench terraces. Cotton part of a cowpea-cotton cropping system on this watershed.								
Notes: To convert runoff in in/hr to cfs multiply by 19.3599								

SELECTED RUNOFF EVENTS						Watkinsville, Georgia Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 15, 1942 - Continued								
						:48a	.671	.1336
						:50	.630	.1553
						:52	.625	.1763
						:54	.708	.1983
						:56	.878	.2249
						:57	1.033	.2408
						:58	1.064	.2583
						:59	1.131	.2766
						3:00	1.183	.2959
						:01	1.240	.3161
						:02	1.260	.3369
						:03	1.240	.3577
						:06	1.002	.4137
						:09	.924	.4619
						:12	.894	.5073
						:15	.842	.5507
						:18	.754	.5906
						:19	.764	.6033
						:20	.775	.6161
						:22	.857	.6433
						:24	.950	.6734
						:26	1.007	.7060
						:28	1.074	.7407
						:30	1.063	.7763
						:33	.945	.8265
						3:36	.826	.8707
						:39	.677	.9083
						:42	.537	.9387
						:45	.464	.9637
						:48	.373	.9846
						:51	.321	1.0018
						:54	.271	1.0166
						:57	.232	1.0291
						4:00	.198	1.0398
						:06	.154	1.0574
						:12	.118	1.0710
						:18	.093	1.0816
						:24	.080	1.0902
						:36	.056	1.1038
						:48	.042	1.1134
						5:00	.033	1.1210
						:20	.019	1.1297
						:40	.012	1.1347
						6:00	.008	1.1380
						:20	.005	1.1400
						:40	.002	1.1413
						7:00	.001	1.1418
						:30	.0015	1.1424
Event of November 26-30, 1948								
10-31-48	.02	0	11-26-48	Raingage	R1-W1	11-26-48		
11-1	.13	0	1:10p	0	0	3:04p	0	0
11-2,3	1.39	0	:40	.18	.06	:36	.0008	.0002
11-6	.99	.0003	2:15	.10	.12	4:06	.0023	.0010
11-10	.03	0	3:15	.37	.49	:36	.0081	.0036
11-13	.03	0	:45	.48	.73	5:06	.0106	.0083
11-16,17	.69	0	5:15	.32	1.22	:22	.0136	.0113
11-19,22	1.70	.0010	:45	.72	1.58	:36	.0256	.0160
11-23,24	2.85	.6104	6:15	.74	1.95	:51	.0547	.0261
			7:00	.32	2.20	6:06	.0775	.0426
Watershed Conditions: Five-year old kudzu. Dense cover over entire area. Kudzu was not utilized; therefore all growth for several years was on the land.			:30	.52	2.46	:21	.1121	.0663
			8:00	.38	2.65	:36	.1472	.0987
			:35	.67	3.04	:51	.1834	.1400
			9:15	.74	3.24	7:06	.1989	.1878
			10:00	.20	3.40	:21	.2169	.2398
Notes: To convert runoff in in/hr to cfs multiply by 19.3599								



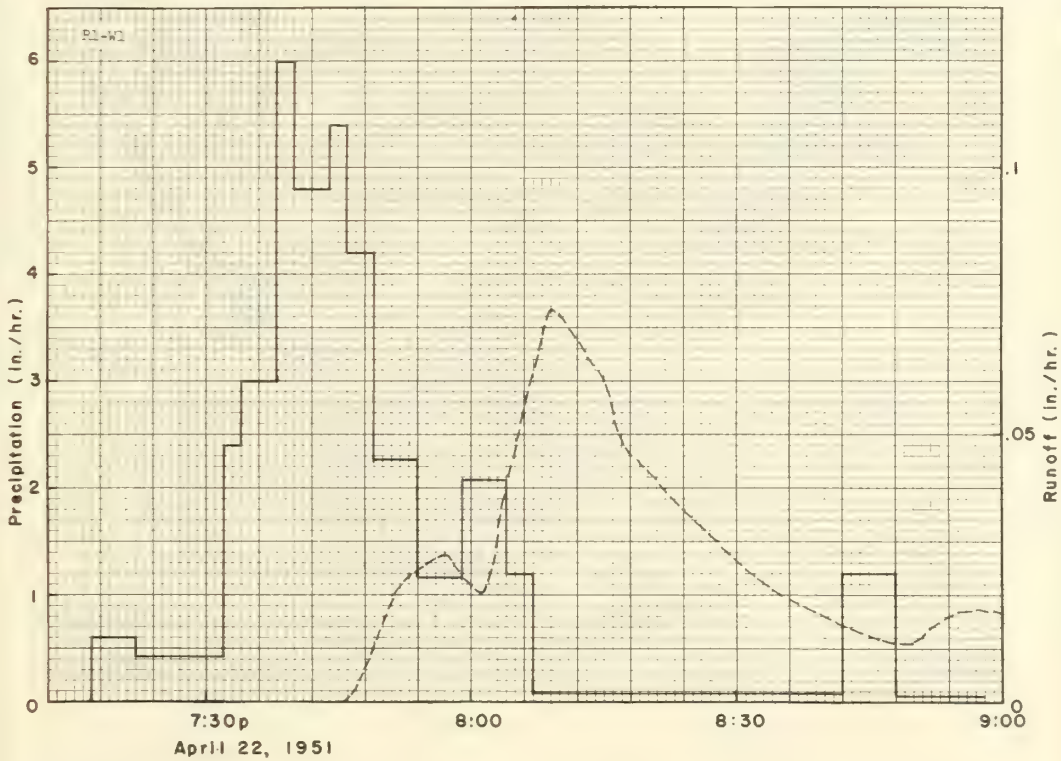
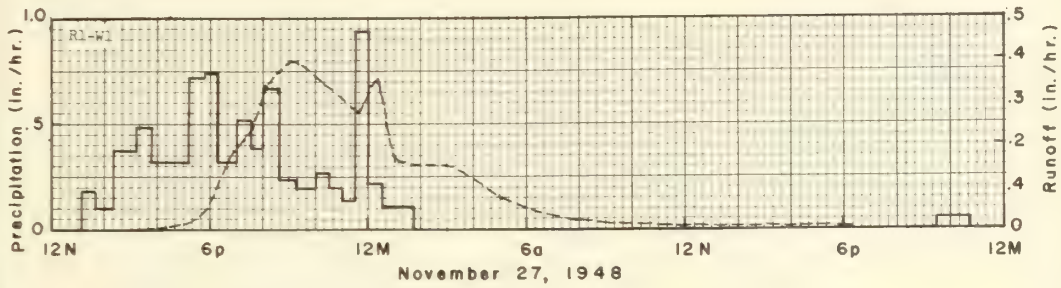
SELECTED RUNOFF EVENTS						Watkinsville, Georgia Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of November 26-30, 1948 - Continued								
			:30p	.27	3.56	:36p	.2479	.2979
			11:00	.20	3.66	:51	.2820	.3641
			:30	.14	3.73	8:06	.3042	.4374
			12:00m	.94	4.20	:36	.3755	.6073
			11-27-48			9:06	.4013	.8015
			12:30a	.22	4.32	10:06	.3585	1.1814
			1:45	.11	4.40	11:06	.3114	1.5164
			9:30p	0	4.40	:36	.2748	1.6630
			10:45	.05	4.46	:51	.3042	1.7354
			11-28-48			11-27-48		
			12:45a	0	4.46	12:06a	.3414	1.8161
			1:45	.02	4.48	:26	.3585	1.9328
			2:30	.31	4.71	1:06	.1642	2.1071
			3:00	.32	4.87	3:06	.1570	2.4283
			5:00	.28	5.42	5:06	.0687	2.6539
			:30	.36	5.60	7:06	.0344	2.7571
			6:00	.80	6.00	9:06	.0197	2.8113
			9:00	.19	6.57	11:06	.0136	2.8445
			11:00	.26	7.08	12:06p	.0106	2.8566
			12:00m	.14	7.22	6:06	.0047	2.9022
			12:30p	.44	7.44	11-28-48		
			1:00	.22	7.55	1:49a	.0027	2.9291
			:30	.14	7.62	2:06	.0047	2.9303
			3:00	.09	7.76	:36	.0073	2.9333
			6:00	.03	7.86	3:06	.0136	2.9385
						:36	.0211	2.9472
						4:06	.0307	2.9602
						:36	.0473	2.9792
						:51	.0573	2.9923
						5:06	.0775	3.0091
						:21	.0956	3.0308
						:36	.1121	3.0568
						:51	.1777	3.0930
						6:06	.2355	3.1446
						:36	.2748	3.2722
						7:06	.2546	3.3956
						:36	.2422	3.5198
						:41	.2479	3.5402
						8:11	.2422	3.6620
						9:06	.2608	3.9004
						:36	.2422	4.0262
						10:21	.2608	4.2209
						:38	.2546	4.2940
						11:06	.2670	4.4174
						:36	.2479	4.5461
						12:04p	.2293	4.6654
						:31	.2422	4.7697
						1:06	.2479	4.9141
						2:06	.2169	5.1465
						3:06	.1777	5.3438
						4:06	.1384	5.5018
						6:06	.0775	5.7178
						8:06	.0405	5.8358
						10:06	.0240	5.9002
						11-29-48		
						12:06a	.0159	5.9402
						6:06	.0052	6.0038
						12:06p	.0008	6.0218
						6:06	.0007	6.0266
						11-30-48		
						12:06a	.0001	6.0290
						6:06	0	6.0298
Notes: To convert runoff in in/hr to cfs multiply by 19.3599								

SELECTED RUNOFF EVENTS						Watkinsville, Georgia Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 22-23, 1951								
3-24-51	.01	0	4-22-51	Raingage	RI-WI	4-22-51		
3-28,30	2.18	.0014	7:17p	0	0	7:45p	0	0
4-2	.50	0	:22	.60	.05	:46	.0007	0
4-7	.66	0	:32	.42	.12	:47	.0032	0
4-12	.27	0	:34	2.40	.20	:49	.0112	.0003
4-16	.03	0	:36	3.00	.30	:51	.0200	.0008
4-19	.37	0	:38	3.00	.40	:53	.0244	.0015
4-20	.70	0	:40	6.00	.60	:55	.0260	.0023
Watershed Conditions: Eight-year old kudzu overplanted to rescue grass in the fall of 1950. Dense mat of kudzu residue with good stand of rescue grass.			:42	4.80	.76	:57	.0277	.0031
			:44	4.80	.92	:59	.0229	.0039
			:46	5.40	1.10	8:01	.0200	.0046
			:49	4.20	1.31	:03	.0313	.0054
			:54	2.28	1.50	:05	.0483	.0067
			:59	1.08	1.59	:07	.0638	.0085
			8:04	2.04	1.76	:09	.0738	.0108
			8:07p	1.20	1.80	8:11p	.0689	.0132
			:42	.04	1.82	:13	.0636	.0154
			:48	1.20	1.94	:15	.0609	.0174
			:58	.30	1.99	:17	.0478	.0192
						:19	.0450	.0201
						:34	.0213	.0284
						:49	.0116	.0325
						:54	.0161	.0337
						:59	.0173	.0351
						9:04	.0123	.0364
						:34	.0091	.0419
						10:04	.0053	.0455
						:19	.0059	.0469
						:34	.0082	.0487
						:49	.0082	.0507
						11:04	.0075	.0527
						4-23-51		
						12:04a	.0053	.0591
						2:04	.0033	.0677
						4:04	.0016	.0725
						6:04	.0007	.0749
						8:04	.0003	.0759
						10:04	.0001	.0763
						12:04p	0	.0765
Notes: To convert runoff in in/hr to cfs multiply by 19.3599								

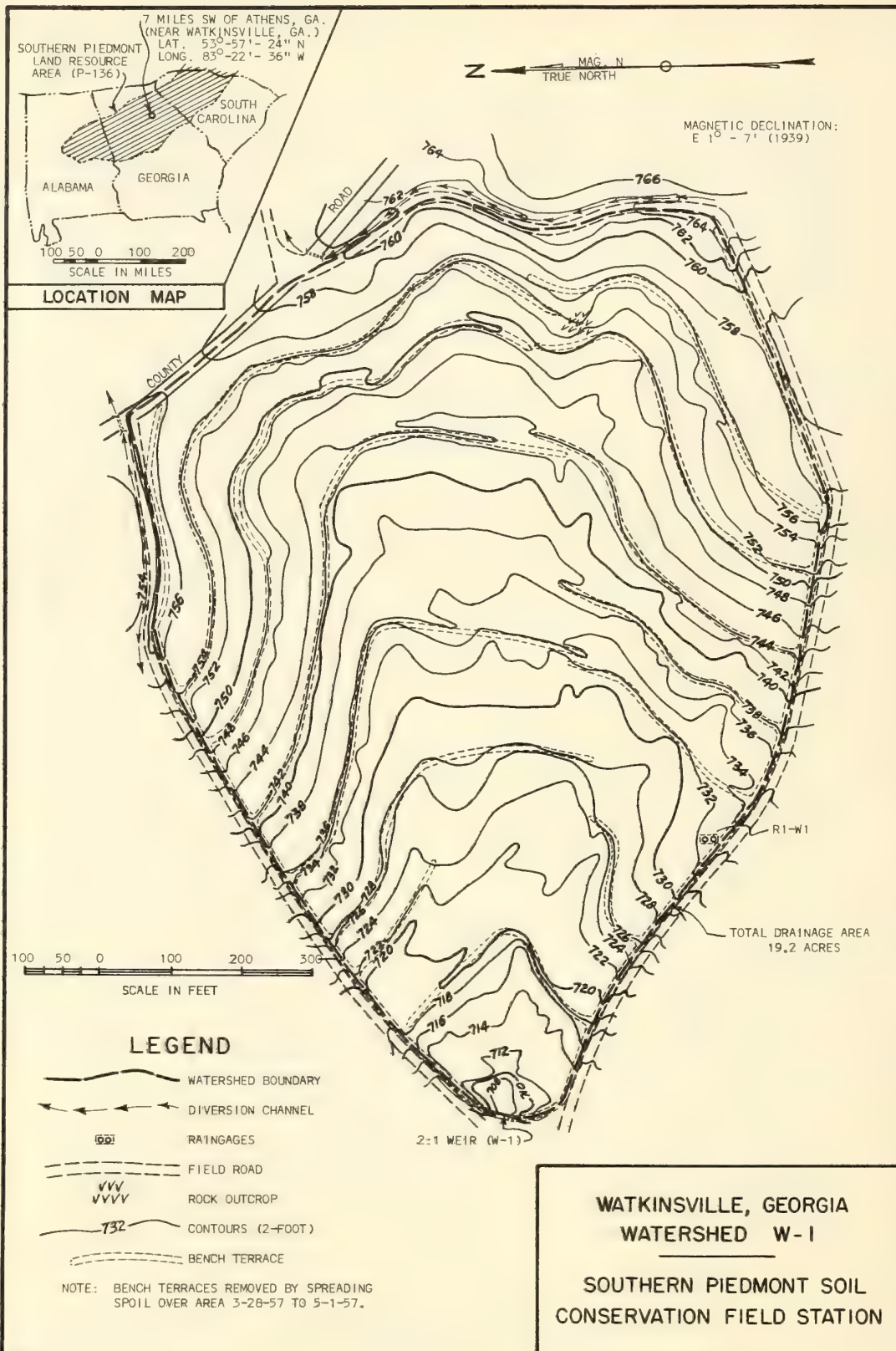


WATKINSVILLE, GEORGIA WATERSHED W-1





WATKINSVILLE, GEORGIA WATERSHED W-1



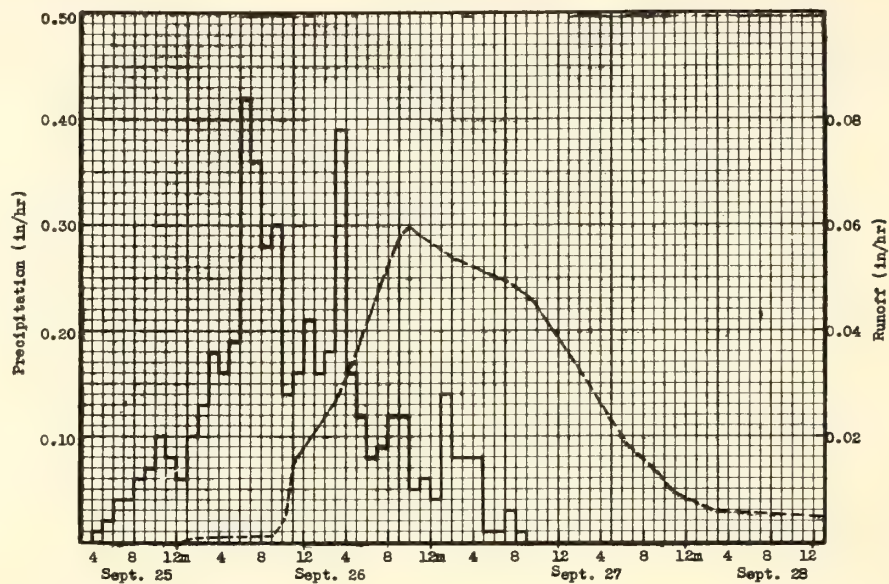
MONTHLY PRECIPITATION AND RUNOFF (Inches)										High Point, N. C. West Fork Deep River Watershed Area - 20,544 ac. (32.1 sq.mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1953	P	4.10	6.30	4.44	2.72	1.17	8.76	1.27	2.96	3.52	0.67	0.37	5.24	41.52		
	Q	2.42	3.36	2.70	1.00	.46	1.58	.26	.17	.25	.18	.21	.99	13.58		
1954	P	6.15	1.62	5.84	3.73	2.56	.82	3.39	6.16	.28	6.99	4.01	3.78	45.33		
	Q	3.78	.70	1.85	1.42	.54	.40	.21	.60	.09	2.09	1.36	2.19	15.23		
1955	P	1.83	4.33	2.11	5.42	2.67	1.25	6.34	7.07	3.78	1.40	2.00	.51	38.71		
	Q	.73	2.07	1.06	1.75	.56	.25	.57	2.58	.33	.71	.40	.36	11.37		
1956	P	1.10	6.07	2.59	3.82	2.00	3.30	3.68	1.36	6.40	3.88	2.06	2.85	39.11		
	Q	.37	2.76	.86	1.46	1.09	.62	.51	.41	1.72	.46	.65	1.20	12.11		
1957	P	3.32	5.30	2.41	4.54	1.45	9.77	4.00	2.38	5.66	2.41	6.09	2.96	50.29		
	Q	1.88	2.68	1.14	1.84	.42	1.37	.37	.20	.45	.41	2.42	1.27	14.45		
1958	P	3.27	3.27	2.86	6.47	5.82	2.99	3.44	4.29	1.37						
	Q	1.55	1.40	1.21	2.24	1.37	.44	.76	.50	.20						
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										High Point, N. C. West Fork Deep River Watershed						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1956	9-26	0.06	9-26	0.06	9-26	0.12	9-26	0.34	9-26	0.65	9-26	1.14	9-26	1.44	2-3	1.70
1957	1-31	.11	1-31	.11	1-31	.21	1-31	.53	1-31	.88	1-31	1.46	1-31	2.21	1-29	2.84
1958	1-25	.04	1-25	.04	1-25	.07	1-25	.21	1-24	.39	1-24	.60	1-24	.71	4-27	1.17
Notes: Quality of records: Monthly P & Q and Annual Max. Discharges and Vols. - good. Monthly Precipitation taken from USWB Annual Summaries for High Point, N.C. Runoff station discontinued 9-30-58. Watershed conditions: Cropland 36%; idle land 7%; pasture 24; woodland 46%; farmyards and urban areas 1%. (From 1935 SCC Survey). 1/ Jan. through Sept. monthly P & Q's repeated from previous publication to complete the year.																
SELECTED RUNOFF EVENTS										High Point, N. C. West Fork Deep River Watershed						
Antecedent conditions				Rainfall				Runoff 5/								
Date	Rainfall 2/ (inches)	Runoff 3/ (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)						
Event of September 25, 1956																
8-27-56	0	.0064		9-25-56	Average of 2 raingages 4/			9-26-56								
8-28	0	.0070		4:00p	0	0		1:00a	0.0003	0						
8-29	.22	.0116		5:00	.01	.01		2:00	.0003	.0003						
8-30	0	.0064		6:00	.02	.03		4:00	.0004	.0011						
8-31	0	.0061		8:00	.04	.11		6:45	.0007	.0025						
9-1	0	.0054		9:00	.06	.17		7:30	.0010	.0031						
9-2	0	.0054		10:00	.07	.24		9:00	.0016	.0051						
9-3	0	.0076		11:00	.10	.34		10:00	.0058	.0084						
9-4	.09	.0127		12:00m	.08	.42		11:00	.0155	.0190						
9-5	0	.0072		9-26-56				12:30p	.0198	.0454						
9-6	.15	.0107		1:00	.06	.48		2:30	.0249	.0902						
9-7	.25	.0095		2:00	.10	.58		4:30	.0338	.1483						
9-8	0	.0056		3:00	.13	.71		7:00	.0485	.2512						
9-9	0	.0051		4:00	.18	.89		9:00	.0585	.3597						
9-10	0	.0051		5:00	.16	1.05		9:45	.0599	.4041						
9-11	0	.0051		6:00	.19	1.24		11:00p	.0585	.4781						
9-12	0	.0049		7:00	.42	1.66		9-27-56								
9-13	0	.0049		8:00	.36	2.02		1:45a	.0543	.6332						
9-14	0	.0043		9:00	.28	2.30		6:45	.0508	.8962						
9-15	0	.0041		10:00	.30	2.60		7:30	.0499	.9340						
9-16	0	.0041		11:00	.14	2.74		10:00	.0450	1.0525						
9-17	0	.0037		12:00n	.16	2.90		1:30p	.0346	1.1924						
9-18	0	.0037		1:00	.21	3.11		4:30	.0249	1.2806						
9-19	0	.0039		2:00	.16	3.27		6:15	.0198	1.3188						
9-20	.72	.0094		3:00	.18	3.45		9:00	.0142	1.3654						
9-21	0	.0041		4:00	.39	3.84		11:00p	.0095	1.3888						
9-22	0	.0041		5:00	.16	4.00		12:00m	.0084	1.3978						
9-23	0	.0041		6:00	.12	4.12		9-28-56								
9-24	.33	.0185		7:00	.08	4.20		3:00a	.0062	1.4197						
9-25	.13	.0093		8:00	.09	4.29		4:00p	.0026	1.4753						
9-26	0	.0003 6/														
Notes: To convert runoff in in/hr to cfs multiply by 20,716.8 2/ Antecedent rainfall taken from USWB Climatological Data for High Point, N.C. 3/ Antecedent runoff taken from USGS Water Supply Papers. 4/ Rainfall from USWB Hourly Precipitation Data, N.C. (average of Greensboro WB Airport & Lexington 7N). 5/ Runoff tabulated from recorder charts. 6/ Runoff prior to 1:00a. (Tabulated). See map page 11.1-5.																

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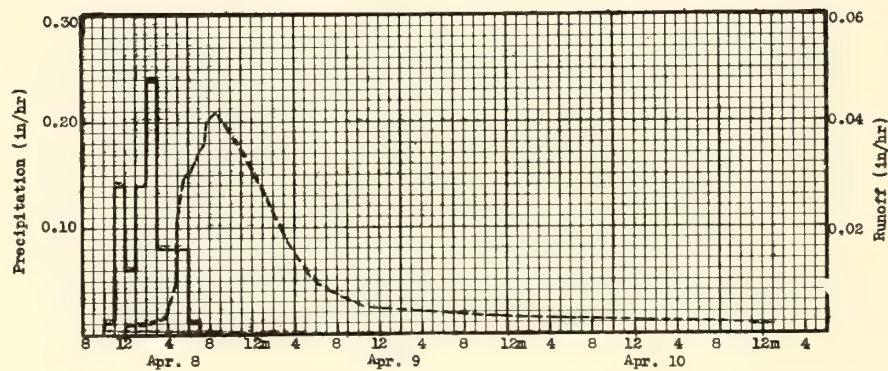


SELECTED RUNOFF EVENTS						High Point, N. C. West Fork Deep River Watershed		
Antecedent conditions			Rainfall			Runoff <sup>4/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff <sup>2/</sup> (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 25, 1956 - continued								
Watershed Conditions: Cropland - 36%; idle land - 9%; pasture - 8%; woodland - 46%; farmyards and urban areas - 1%. (Note - information taken from 1935 survey as reported in USDA-SCS-TP-48.)			9:00	.12	4.41	11:00p	.0020	1.4913
			11:00	.05	4.51	9-29-56		
			12:00m	.06	4.57	12:00n	.0014	1.5139
			9-27-56			12:00m	.0011	1.5289
			1:00a	.04	4.61			
			2:00	.14	4.75			
			3:00	.08	4.83			
			4:00	.08	4.91			
			6:00	.01	4.93			
			8:00	.03	4.99			
			9:00	.01	5.00			
Event of April 8, 1957								
3-9-57	0	.0313	4-8-57	Average of 2 raingages <sup>3/</sup>	0	4-8-57		
3-10	0	.0255	10:00a	0	0	12:00n	.0016	0
3-11	0	.0232	11:00	.01	.01	1:00	.0017	.0016
3-12	0	.0232	12:00n	.14	.15	2:00	.0019	.0034
3-13	0	.0220	1:00	.06	.21	3:00	.0023	.0055
3-14	.33	.0290	2:00	.14	.35	3:30	.0031	.0069
3-15	.10	.0290	3:00	.24	.59	4:30	.0170	.0163
3-16	0	.0243	4:00	.08	.67	5:30	.0297	.0408
3-17	0	.0220	7:00	.01	.70	6:00	.0313	.0558
3-18	0	.0209	8:00	0	.70	7:00	.0352	.0890
3-19	.37	.0313				7:30	.0398	.1078
3-20	0	.0243				8:00	.0416	.1282
3-21	0	.0209				8:30	.0420	.1491
3-22	.79	.0718				9:00	.0407	.1697
3-23	0	.0510				12:00m	.0302	.2754
3-24	0	.0336				4-9-57		
3-25	.39	.0718				1:00a	.0261	.3036
3-26	0	.0440				3:00	.0178	.3471
3-27	0	.0336				6:00	.0098	.3877
3-28	.02	.0278				8:00	.0070	.4043
3-29	0	.0255				10:00	.0055	.4146
3-30	0	.0232				11:00	.0051	.4220
3-31	0	.0220				4:00p	.0040	.4445
4-1	.12	.0220				11:00	.0029	.4683
4-2	.17	.0255				4-10-57		
4-3	0	.0220				4:15a	.0026	.4825
4-4	0	.0209				12:00	.0022	.5013
4-5	2.05	.5387				12:00m	.0018	.5247
4-6	0	.1842	Watershed Conditions: Same as Event of September 25, 1956.					
4-7	0	.0556						
4-8	0	.0017 <sup>5/</sup>						
Event of January 24, 1958								
12-25-57	T	0.0197	1-24-58	Average of 3 raingages <sup>6/</sup>	0	1-24-58		
12-26	.67	.1251	6:00a	0	0	12:00n	.0013	0
12-27	0	.0475	8:00	.04	.08	1:00	.0014	.0013
12-28	T	.0336	9:00	.02	.10	2:00	.0020	.0030
12-29	0	.0278	10:00	.05	.15	3:00	.0077	.0072
12-30	0	.0243	11:00	.09	.24	4:00	.0170	.0196
12-31	0	.0220	12:00n	.10	.34	5:00	.0198	.0380
1-1-58	0	.0232	1:00	.12	.46	5:45	.0220	.0540
1-2	0	.0197	2:00	.22	.68	7:00	.0222	.0816
1-3	0	.0197	3:00	.04	.72	8:30	.0220	.1147
1-4	0	.0185	4:00	.07	.79	9:00	.0229	.1259
1-5	0	.0197	5:00	.03	.82	10:30	.0289	.1652
1-6	0	.0209	7:00	.02	.84	12:00m	.0315	.2111
1-7	.25	.0185	8:00	.12	.96	1-25-58		
1-8	0	.0185	9:00	.20	1.10	2:30a	.0362	.2957
Notes: To convert runoff in in/hr to cfs multiply by 20,716.8 <sup>1/</sup> Antecedent rainfall from USWB Climatological Data for High Point, N.C. <sup>2/</sup> Antecedent runoff from USGS Water Supply Papers. <sup>3/</sup> Rainfall from USWB Hourly Data, N.C. (average of Greensboro WB Airport & Lexington 7N). <sup>4/</sup> Runoff tabulated and computed from stage recorder charts. <sup>5/</sup> Runoff prior to 12:00n (Tabulated). <sup>6/</sup> Rainfall from Hourly Data for gages under (3/) plus Winston-Salem WB Airport.								

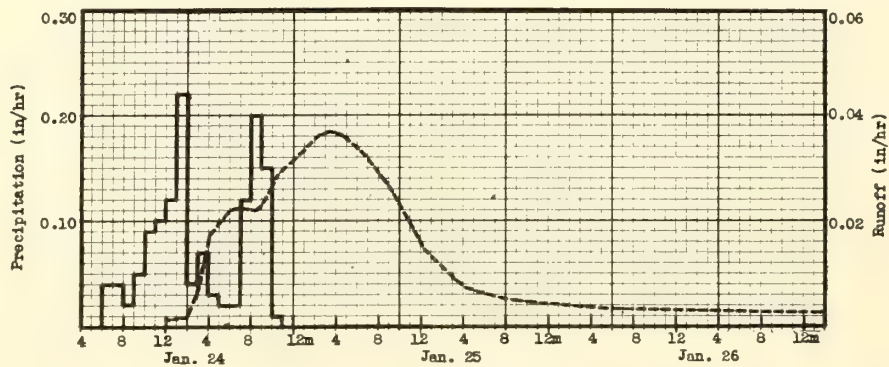
SELECTED RUNOFF EVENTS						High Point, N. C. West Fork Deep River Watershed		
Antecedent conditions			Rainfall <sup>3</sup>			Runoff <sup>4</sup>		
Date	Rainfall <sup>1</sup> (inches)	Runoff <sup>2</sup> (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 24, 1958 - continued								
1-9-58	0	.0174	10:00p	.15	1.25	3:30a	.0368	.3323
1-10	0	.0139	11:00	.01	1.26	4:30	.0362	.3689
1-11	0	.0139				7:00	.0319	.4543
1-12	0	.0139				9:00	.0265	.5127
1-13	.06	.0209				12:00n	.0153	.5732
1-14	.79	.1031				3:00	.0092	.6094
1-15	0	.0452				4:15	.0077	.6198
1-16	0	.0324				8:30	.0051	.6466
1-17	0	.0255				10:00	.0048	.6741
1-18	0	.0220				1-26-58		
1-19	0	.0197				6:00a	.0035	.6866
1-20	0	.0197				7:00p	.0025	.7251
1-21	.67	.0543				1-27-58		
1-22	.07	.0649				2:00a	.0022	.7419
1-23	0	.0313				3:00p	.0018	.7676
1-24	0	.0012 <sup>5</sup>				12:00m	.0016	.7832
Watershed Conditions: Same as Event of September 25, 1956.								
Notes: To convert runoff in in/hr to cfs multiply by 60,716.6 <sup>1</sup> Antecedent rainfall from MWR Climatology and Data for High Point, N.C. <sup>2</sup> Antecedent runoff taken from MWR Water Supply Papers. <sup>3</sup> Rainfall from MWR Pointy Lake Gaugage at Greensboro WE Airport, Lexington TN, & Winston-Salem WE Airport). <sup>4</sup> Runoff tabulated and computed from MWS stage recorder charts. <sup>5</sup> Runoff prior to 12:00n (Computed).								



September 25, 1956



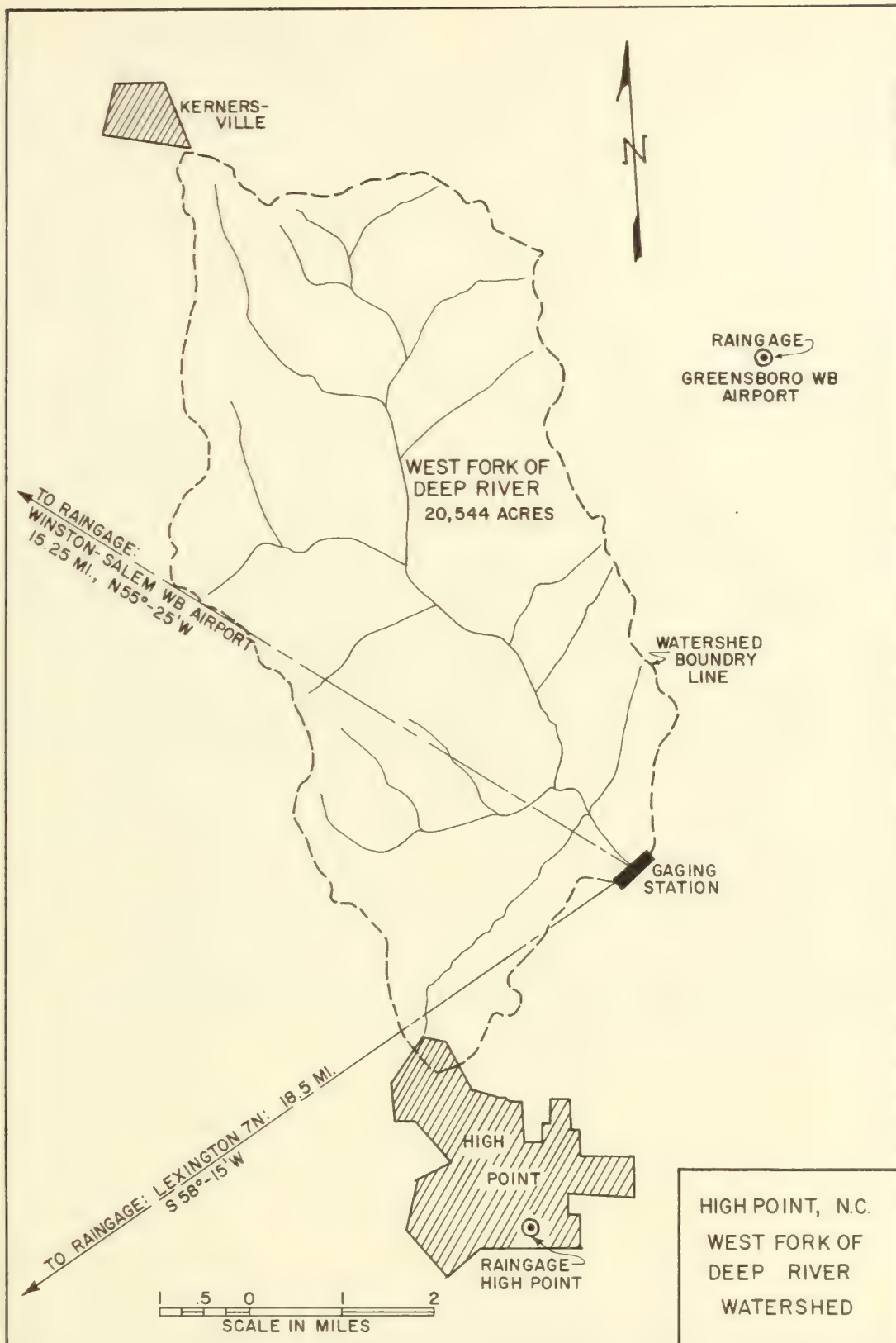
April 8, 1957



January 24, 1958

HIGH POINT, NORTH CAROLINA WEST FORK DEEP RIVER WATERSHED





MONTHLY PRECIPITATION AND RUNOFF (Inches)								High Point, North Carolina Muddy Creek Watershed Area - 10,350 ac. (16.2 sq. mi.)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1934 P						h 3.28	h 7.92	h 3.10	8.71	1.86	4.48	2.88	32.23			
Q						2.13	.36	.02	.97	.41	.69	1.86	6.44			
1935 P	1.30	2.92	6.67	3.90	4.13	1.50	5.08	1.69	4.50	1.52	3.14	2.62	38.97			
Q	1.78	1.45	3.65	3.05	1.19	.22	.42	.03	.12	.04	.28	.26	12.49			
1936 P	7.18	3.76	5.13	5.84	.13	4.81	7.07	5.79	5.77	6.04	1.81	5.38	58.71			
Q	5.88	4.00	3.10	4.92	.13	.30	.42	1.87	.88	2.97	.42	2.25	27.14			
1937 P	8.87	2.96	1.37	5.05	3.18	2.53	3.51	6.90	1.90	3.50	2.04	1.72	43.53			
Q	6.78	1.87	1.28	1.93	1.06	.11	.19	.58	.22	.81	.53	.62	15.98			
1938 P	2.84	1.03	2.42	2.39	2.42	7.19	7.79	4.30	2.02	.98	4.39	4.02	41.79			
Q	1.44	.57	1.00	.76	.14	1.81	2.63	.68	.07	.05	.72	1.68	11.55			
1939 P	3.44	7.26	4.75	2.95	2.22	2.94	8.42	7.63	.07	2.51	1.68	2.92	46.79			
Q	1.75	5.72	2.69	.94	.56	.15	.86	1.42	.10	.13	.14	.44	14.90			
1940 P	* 2.82	2.50	2.44	2.85	6.70	3.94	4.40	8.00	1.20	h 1.35	h 6.17	h 3.91	46.28			
Q	.90	2.23	1.29	1.10	2.17	1.05	.28	2.13	.11	.05	1.68	.97	13.96			
1941 P	h 1.90	h 1.03	h 3.78	h 3.23	h 1.53	h 3.49	h 9.96	h 1.56	h 1.76	h .65	h .53	h 3.28	h 32.70			
Q	1.34	.55	1.30	1.45	.18	.11	.80	.04	.05	0	.01	.11	5.94			
**Av. P	4.05	3.07	3.79	3.74	2.90	3.77	6.60	5.13	2.46	2.37	2.82	3.41	44.11			
**Av. Q	2.84	2.34	2.04	2.02	.78	.54	.80	.96	.22	.58	.54	.90	14.56			
Normal P	3.40	3.60	4.30	3.60	3.80	4.40	5.00	4.40	3.00	2.50	2.20	3.60	43.80			
Notes: * Partially estimated. ** Does not include the part year amounts for 1934. <sup>†</sup> Part of January 1935 runoff result- ed from the thawing of frozen rain occurring December 31, 1934. <sup>h</sup> Precipitation taken from USWB Climatological Data as given for High Point, N. C. Other precipitation values are the averages of 2 to 6 raingages in operation during the period. Normal P based on 34 yr. record (1921-40, 1942-55) at High Point, N. C. Quality of records: P- Good, Q- Good.																
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								High Point, North Carolina Muddy Creek Watershed								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1934	6-7	0.06	6-7	0.06	6-7	0.12	12-1	0.33	12-1	0.60	11-30	0.82	6-5	1.08	6-1	1.84
1935	3-12	.06	3-12	.06	3-12	.11	3-12	.32	3-12	.56	3-12	.80	3-12	.94	3-25	1.85
1936	8-7	.19	8-7	.19	8-7	.37	8-7	.89	8-7	1.30	4-6	1.71	4-6	2.16	4-2	3.87
1937	1-19	.08	1-19	.08	1-19	.16	1-19	.43	1-19	.68	1-19	1.11	1-19	1.64	1-15	2.76
1938	6-28	.21	6-28	.20	6-28	.39	6-28	.93	6-28	1.16	7-23	1.26	7-23	1.46	7-18	2.04
1939	2-26	.09	2-26	.09	2-26	.17	2-26	.47	2-9	.75	2-9	.99	2-9	1.20	2-26	2.88
1940	5-30	.17	5-30	.16	5-30	.32	5-30	.73	5-29	1.01	5-29	1.48	5-29	1.79	5-29	1.99
1941	7-10	.04	7-10	.04	7-10	.08	7-10	.16	3-28	.25	3-27	.32	3-28	.39	3-28	.78
Notes: Records began 5-19-34. Quality of records: Good, except for 1934 and 1941, which are fair. 1/ Determined from runoff compilations using gage heights tabulated from recorder charts. Watershed area of 16.2 sq. mi. used for all years of records.																

Cooperative Research Project of USDA, USGS, and North Carolina Agricultural Experiment Station.

MONTHLY PRECIPITATION AND RUNOFF (Inches)								High Point, N. C. Uharie (Uwharrie) River Watershed Area - 7,230 ac. (11.3 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1934	P						3.30	7.20	3.10	7.18	1.88	3.47	3.17	30.50
	R						2.10	.85	.20	.11	.41	.47	1.29	5.43
1935	P	1.44	2.65	6.35	3.75	4.16	1.49	6.07	1.59	3.95	1.81	3.46	2.24	38.96
	R	1.37	1.36	3.01	2.33	1.00	.25	.75	.09	.35	.12	.50	.30	11.43
1936	P	8.03	3.85	4.74	5.73	1.14	3.35	4.20	4.36	6.12	5.35	1.59	4.94	54.30
	R	5.29	1.61	2.42	4.42	.3	.24	.38	.23	.77	2.32	.35	1.98	23.02
1937	P	8.06	2.83	1.41	5.05	3.22	2.23	3.06	7.01	1.72	4.20	2.00	1.75	42.74
	R	5.67	1.41	* 1.10	2.10	.94	.24	.30	.69	.20	.46	.37	.48	14.03
1938	P	2.67	.93	2.16	2.67	3.12	8.05	6.23	3.00	1.99	.95	4.84	3.84	40.45
	R	1.34	.43	.87	.64	.14	.62	1.89	.91	.10	.07	.88	1.52	8.16
1939	P	3.44	6.65	4.81	2.16	2.28	2.41	6.31	7.55	.14	2.63	1.83	2.71	40.94
	R	1.58	4.98	1.27	.74	.22	.22	.70	1.83	.13	.30	.19	.50	13.88
1940	P	1.75	2.36	2.46	2.81	4.44	2.20	4.33	9.03	1.13	1.35	6.17	3.91	45.02
	R	.75	1.74	1.10	1.02	.31	.44	.44	2.57	.17	.04	1.44	.79	12.94
1941	P	1.14	1.03	3.78	3.13	1.13	4.40	4.30	1.14	1.77	1.44	1.13	3.28	32.70
	R	1.22	.48	1.27	1.12	.30	.25	1.53	.08	.03	.01	.04	.17	6.50
**Av.	P	1.44	2.90	3.76	3.63	3.00	3.32	5.96	4.87	2.40	2.42	2.92	3.28	42.44
**Av.	R	1.43	2.01	1.72	1.77	.77	.51	.77	.70	.25	.48	.54	.82	12.85
Normal	P	3.40	3.60	4.30	3.60	3.80	4.40	5.00	4.40	3.00	2.50	2.20	3.60	43.80

Notes: \* Partially estimated. \*\* Does not include the part year amounts for 1934. † Precipitation taken from USWB climatological data as given for High Point, North Carolina. ‡ Lower precipitation values are the averages of 2 to 5 rain-gages in operation during the period. Normal ‡ based on 34 yr. record (1911-46, 1942-55) at High Point, N. C. Quality of records: ‡ - Good, ‡ - Good.

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								High Point, N. C. Uharie (Uwharrie) River Watershed								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1934	6-6	0.10	6-6	0.10	6-6	0.19	6-6	.42	6-6	0.52	6-6	0.60	6-5	0.40	6-1	1.10
1935	7-13	.10	7-13	.09	7-13	.14	3-12	.41	3-12	.70	3-12	.90	3-12	1.05	3-1	1.43
1936	10-8	.21	10-8	.20	4-4	.38	4-6	.30	4-4	1.27	4-4	1.44	4-6	1.98	4-2	3.48
1937	1-19	.14	1-19	.14	1-19	.26	1-19	.57	1-19	.78	1-19	1.20	1-19	1.63	1-1	2.56
1938	7-23	.08	7-23	.11	7-23	.15	12-26	.33	12-26	.45	12-26	.54	7-23	.62	7-23	1.12
1939	2-26	.14	2-26	.13	2-26	.26	2-26	.60	2-26	.78	2-26	.91	2-25	1.02	2-25	2.63
1940	8-14	.29	8-14	.28	8-14	.44	8-14	.70	8-14	.90	8-14	1.10	8-14	2.05	8-13	2.36
1941	7-17	e .30	7-17	e .30	7-17	e .44	7-17	e .93	7-16	e 1.40	7-16	e 1.09	7-16	e 1.12	7-16	e 1.28

Notes: Records based 3-12-34. † Partially estimated. Quality of records: Good except for 1934, which are fair, and 1941, which are poor. ‡ Determined from runoff compilation. † Volume figures tabulated from recorder charts.

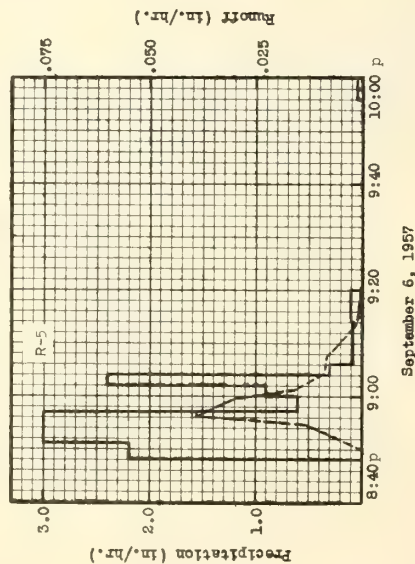
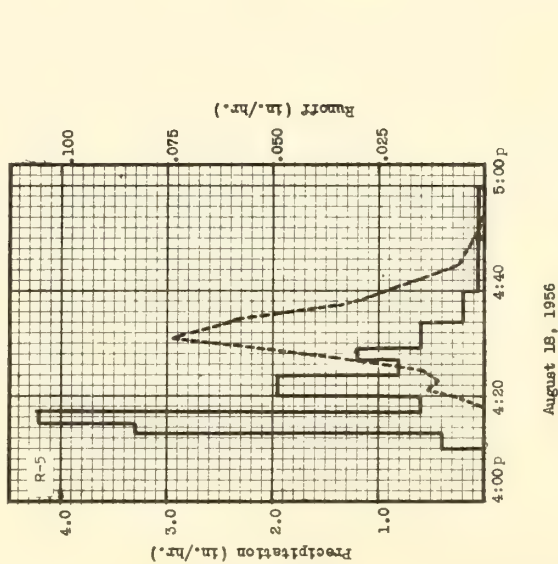
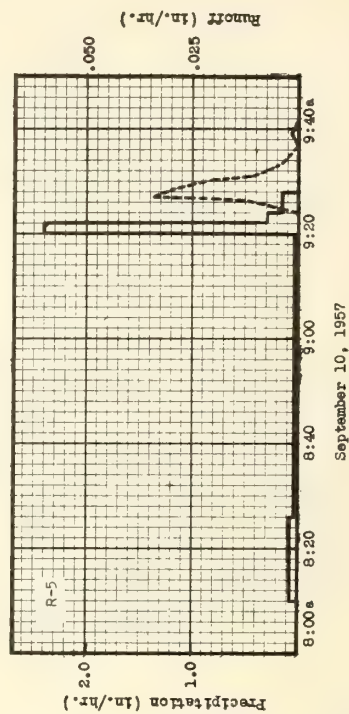
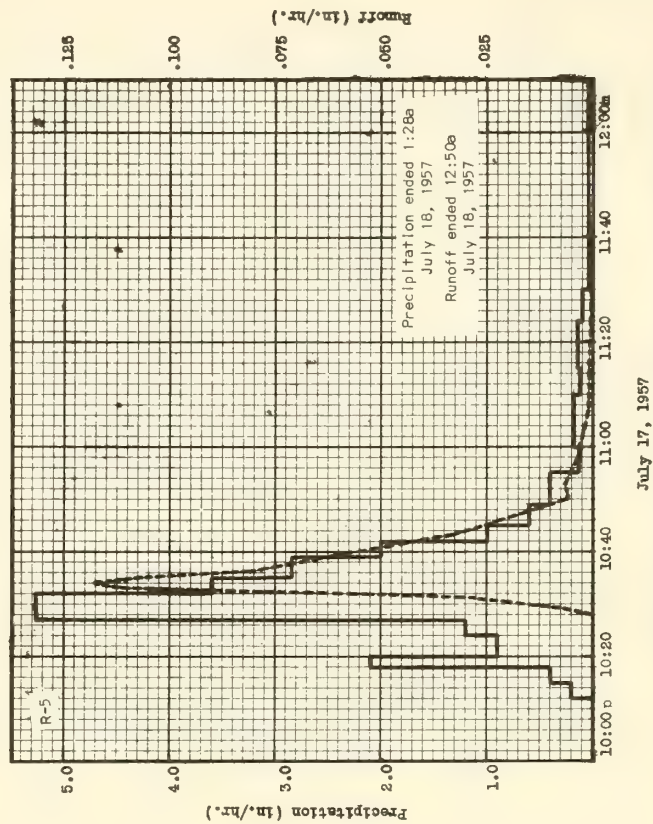


MONTHLY PRECIPITATION AND RUNOFF (Inches)								Blacksburg, Virginia Watershed W-III Area - 19.3 acres								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	0.60 0	4.58 .01	2.71 T	3.96 T	2.22 T	4.58 .02	3.66 T	2.33 .02	4.68 T	3.14 T	1.76 T	2.11 T	36.33 .05			
1957 P Q	5.62 .02	5.16 .01	1.46 T	4.37 .03	1.89 T	4.70 .01	3.03 .02	1.00 T	8.29 .05	1.99 T	3.96 .01	2.84 T	44.31 .15			
1958 P Q	2.29 .01	2.56 .08	4.13 T	3.99 T	5.79 .02	2.43 0	2.89 T	2.52 T	2.13 0	1.05 0	1.91 0	4.44 T	36.13 .11			
1959 P Q	2.26 T	1.62 0	3.18 0	4.70 T	2.35 0	1.67 0	2.57 T	4.55 T	7.62 .14	3.93 T	2.54 T	2.79 T	39.78 .14			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Blacksburg, Virginia Watershed W-III								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	1-29	0.09	7-17	0.02	7-17	0.02	7-17	0.02	1-29	0.02	1-29	0.02	1-29	0.02	4-2	0.03
1958	5-5	.06	5-5	.01	5-5	.01	2-24	.03	2-24	.05	2-24	.08	2-24	.08	2-24	.08
1959	9-30	.81	9-30	.13	9-30	.13	9-30	.13	9-30	.13	9-29	.14	9-29	.14	9-29	.14
Notes: Quality of records: Monthly P & Q and Annual Max. Discharges and Vols. - excellent. Watershed Conditions: Crop yields: Corn (1956-1959) consistent averaged 80-85 bushels per acre; wheat (1956) about 20 bushels, (1957-1959) about 8-10 bushels per acre; clover hay (1956-1959) between 1.1-1.5 tons per acre.																
SELECTED RUNOFF EVENTS								Blacksburg, Virginia Watershed W-III								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)		Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)		Acc. (inches)					
Event of August 18, 1956																
7-19-56	0.16		0		8-18-56	Rainage	R-5	8-18-56								
7-20	.75		T		4:10p	0	0	4:18p	0		0					
7-23	.39		T		:13	.40	.02	:20	.007		T					
7-24	.22		T		:15	3.30	.13	:21	.013		T					
7-25	.29		T		:17	4.20	.27	:23	.011		.001					
7-27	.48		T		:20	.60	.30	:25	.014		.001					
7-29	.05		0		:24	1.95	.43	:29	.051		.003					
7-30	.03		0		:27	.80	.47	:31	.073		.005					
8-4	.07		0		:29	1.20	.51	:34	.060		.009					
8-11	.07		0		:34	.60	.56	:37	.035		.011					
Watershed Conditions: The cultivated					:40	.20	.58	:38	.030		.012					
portion, 89% of the watershed, was in					:50	.06	.59	:45	.007		.014					
contour strip crops with a rotation of					5:00	.06	.60	:52	T		.014					
(barley & clover) 31%; (corn) 48% and								:56	0		.014					
(soybeans & sudan grass) 10%. Barley																
was harvested June 29. On Aug. 18, corn																
was approx. 10 ft. high, clover was 14".																
9% of area was in pasture & 2% woods.																
Event of July 17-18, 1957																
6-17-57	0.08		0		7-17-57	Rainage	R-5	7-17-57								
6-22	.15		0		10:12p	0	0	10:28p	0		0					
6-23	.35		0		:15	.20	.01	:29	.007		T					
6-24	.13		0		:18	.40	.03	:31	.027		.001					
6-25	.10		0		:20	2.10	.10	:32	.067		.002					
6-26	.03		0		:22	.90	.13	:33	.114		.003					
6-28	.21		0		:24	.90	.16	:34	.118		.005					
7-9	.33		0		:27	1.20	.22	:35	.107		.007					
7-17	.67 1/		T 1/		:32	5.28	.66	:36	.081		.008					
					:35	3.60	.84	:43	.033		.015					
					:39	2.85	1.03	:50	.006		.017					
					:42	2.00	1.13	:53	.007		.017					
					:45	1.00	1.18	11:00	.003		.018					
					:49	.60	1.22	:07	.001		.018					
					:52	.40	1.24	:15	.001		.018					
Notes: To convert runoff in in/hr to cfs, multiply by 19.4544. 1/ Prior to event beginning 8:12p. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS, SWS, January 1960, page 13.2-4.																

Cooperative Research Project of USDA and Virginia Agricultural Experiment Station

SELECTED RUNOFF EVENTS						Blacksburg, Virginia Watershed W-III		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 17-18, 1957 - Continued</u>								
Watershed Conditions: The cultivated portion (56%) was in contour strips with a rotation of wheat, soybeans and clover. 45% of area was in wheat harvested July 5-12. 13% of area was in soybeans 26" high on event date and 31% of area was in clover, second growth 5"-8" high. 9% of area was in pasture and 2% in woods.			10:55p	.40	1.26	11:34p	T	.018
			11:00	.12	1.27	7-18-57		
			:10	.18	1.30	12:50e	O	.018
			:15	.12	1.31			
			:24	.13	1.33			
			:30	.10	1.34			
			7-18-57					
			12:20a	.01	1.35			
<u>Event of September 6, 1957</u>								
8-15-57	0.31	O	9-6-57	Rainage	R-5	9-6-57		
8-18	.38	O	8:48p	0	0	8:50p	O	O
8-19	.02	O	:51	2.20	.11	:54	.012	T
9-2	.06	O	:53	3.00	.21	:56	.039	.001
9-6	.28 1/	T 1/	:55	3.00	.31	:59	.031	.003
Watershed Conditions: The cultivated portion (89%) of the watershed was in the clover phase of a wheat, clover and soybean rotation. 31% of the area was in clover, 9" - 11" high on event date. 45% of area was in wheat stubble with new clover 5" - 7" high. 13% of area was in soybean stubble with clover 10" high. 9% of the area was in pasture & 2% in woods.			:57	3.00	.41	9:01	.016	.004
			9:00	.60	.44	:04	.009	.004
			:02	.90	.47	:07	.008	.005
			:04	2.40	.55	:14	.001	.005
			:06	.30	.56	:20	O	.005
			:14	.08	.57			
			:20	.10	.58			
			:56	0	0			
<u>Event of September 10, 1957</u>								
8-15-57	0.31	O	9-10-57	Rainage	R-5	9-10-57		
8-18	.38	O	8:10a	0	0	9:24a	O	O
8-19	.02	O	:26	.08	.02	:26	.012	T
9-2	.06	O	9:20	.01	.03	:27	.034	.001
9-6	.95	T	:22	2.40	.11	:28	.031	.001
9-7	.05	O	:24	.30	.12	:30	.022	.002
9-8	.40	T	:28	.15	.13	:31	.011	.002
9-9	.18	O				:33	.005	.002
Watershed Conditions: The cultivated portion (69%) of the watershed was in the clover phase of a wheat, clover and soybean rotation. 31% of the area was in clover 11-14" high on event date. 45% of area was in wheat stubble with new clover 8-10" high. 13% of area was in soybean stubble with clover 12" high. 9% of the area was in pasture and 2% in woods.						:37	O	.003
						:39	T	.003
						:41	O	.003

Notes: To convert runoff in in/hr to cfs, multiply by 19.4544. 1/ Prior to event beginning 8:48p.



BLACKSBURG, VIRGINIA WATERSHED W-III



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Blacksburg, Virginia Watershed W-IV Area - 3.49 acres								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	3.66 0	4.46 0	2.86 0	3.91 0	1.96 0	5.77 .06	3.75 T	2.86 .05	4.33 .08	2.63 0	1.61 0	2.06 T	37.00 .19			
1957 P Q	5.78 .18	4.42 T	1.42 0	4.39 .08	1.68 0	5.35 T	2.51 .02	.89 0	9.66 .03	1.75 0	3.47 0	2.64 0	43.83 .31			
1958 P Q	3.24 .03	2.12 .09	3.69 0	4.14 T	5.82 .24	2.93 T	2.70 .01	2.43 0	1.94 T	1.18 0	2.10 0	3.32 .03	34.42 .40			
1959 P Q	3.29 .02	1.44 0	3.22 0	4.31 0	2.31 0	1.70 0	4.16 .01	3.65 .01	6.77 .11	3.73 0	2.64 T	2.74 .01	39.16 .16			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Blacksburg, Virginia Watershed W-IV								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	1-29	0.18	1-29	0.07	1-29	0.16	1-29	0.16	1-29	0.18	1-29	0.18	1-29	0.18	1-29	0.18
1958	5-5	.75	5-5	.21	5-5	.21	5-5	.23	5-5	.24	5-5	.24	5-5	.24	5-5	.24
1959	9-30	.28	9-30	.11	9-30	.11	9-30	.11	9-30	.11	9-30	.11	9-30	.11	9-30	.11
Notes: Quality of records: Monthly P & Q and Annual Maximum Discharges and Vols. - excellent. Watershed Conditions: Crop Yields: Corn (1956-1959) 82.0-92.0 bushels per acre; Clover hay (1956-1959) 1.3-1.5 tons per acre; Wheat (1956) 23.0 bushels per acre, (1957-1959) 11.0-12.0 bushels per acre.																
SELECTED RUNOFF EVENTS																
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)						
Notes:																



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Blacksburg, Virginia Watershed W-VI Area - 7.70 acres								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	0.66 0	4.60 .01	2.86 0	3.91 .03	1.95 0	5.77 .11	3.75 .02	2.86 .12	4.33 .16	2.63 T	1.61 T	2.06 T	37.00 .45			
1957 P Q	5.75 .26	4.62 .04	1.12 0	4.39 .13	1.68 0	5.35 .01	2.51 .03	.89 0	9.66 .13	1.75 0	3.47 .02	2.64 T	43.83 .62			
1958 P Q	2.04 .06	2.11 .43	3.69 .04	4.16 .06	5.82 .46	2.93 .01	2.70 .02	2.43 0	1.94 0	1.18 0	2.10 T	3.32 .34	34.42 1.42			
1959 P Q	2.29 .09	1.44 0	3.22 T	4.31 .01	2.51 T	1.70 T	4.16 .05	3.65 .06	6.77 .22	3.73 .04	2.64 .06	2.74 .06	39.16 .59			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Blacksburg, Virginia Watershed W-VI								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	1-29	0.13	1-29	0.06	1-29	0.10	1-29	0.20	1-29	0.24	1-29	0.25	1-29	0.25	1-29	0.26
1958	5-5	.95	5-5	.24	5-5	.26	5-5	.30	5-5	.35	5-5	.39	5-5	.44	5-5	.46
1959	9-30	.4	9-30	.14	9-30	.14	9-30	.18	9-30	.19	9-29	.20	9-29	.20	9-29	.20
Notes: Quality of records: Monthly P & Q and Annual Max. Discharges and Vols. - excellent. Watershed Conditions: Crop Yields: Corn (1956) 79.6 bushels per acre, (1957) 91.1 bushels per acre, (1958) 75.4 bushels per acre, (1959) 90.7 bushels per acre; Wheat (1956) 16.4 bushels per acre, (1957) 7.2 bushels per acre, (1958) 9.2 bushels per acre, (1959) 8.0 bushels per acre; Clover hay (1956-1959) 1.1-1.3 tons per acre.																
SELECTED RUNOFF EVENTS																
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)		Runoff (inches)	Date and time	Intensity (in/hr)		Acc. (inches)	Date and time	Rate (in/hr)		Acc. (inches)					
Notes:																



## BLACKSBURG, VA. Thorne Creek Watershed W-I

**LOCATION:** Pulaski Co., Va.;  $3\frac{1}{2}$  mi. W. of Dublin, Va., Peak Creek, New River.

**AREA:** 3,054 acres (4.77 sq. mi.)

**SHAPE:** Roughly oval, about 3.8 mi. long by 1.7 mi. wide. Made up of two fan-shaped subareas with channel confluence about 1800 ft. above gaging station.

**SLOPES:** 4% is in 0-2%; 31% is in 2-7%; 32% is in 7-15%; 28% is in 15-25%; 5% is in 25-45%. Aspect E - SE.

**SOILS:** Residual, derived from dolomitic limestones, sandstones and shales. 1 Groeclose silt loam 30%; 2 Lodi loam 17%; 3 Frederick silt loam 14%; 4 Litz silt loam 12%; 5 Nine miscellaneous silt loams 12%; 6 Greendale silt loam 8%; 7 Four other silt loams 7%. Topsoil - weak very fine granular structure, 1 & 2; weak fine granular to subangular blocky, 4 & 6; weak medium subangular blocky, 3; range in depth - 8 to 16 in., 1 & 3; 5 to 25 in., 2; 2 to 12 in., 4; 5 to 10 in., 6. Subsoil - weak fine subangular blocky structure, 2 & 4; weak to moderate fine subangular blocky, 1; moderate medium to coarse subangular blocky, 3; moderate medium subangular blocky, 6; range in depth below surface - 36 to 60 in., 1 & 3; 32 to 50 in., 2; 10 to 20 in., 4; 20 to 36 in., 6. Effective total depths - Nine miscellaneous silt loams, up to 36 in., 5; Four other silt loams, 16 to 30 in., 7. Permeability of topsoil and subsoil - moderate, 1; moderately rapid, 3, 4, & 5; moderate to moderately rapid, 2; moderately slow to moderate permeability, 6 & 7. Internal drainage - medium, 1, 2, 3, 5, & 6; rapid, 4; slow, 7.

**EROSION:** 1 - 87%; 2 - 13%.

**LAND CAPABILITY:** II - 30%; III - 31%; IV - 22%; VI - 12%; VII - 5%.

**SURFACE DRAINAGE:** Good; principal waterway about 17,600 ft. 29% of the area is above farm ponds and contributes to surface runoff during periods of excessive rainfall. 29% of area is above sinks with no contribution to surface runoff.

**CHARACTER OF FLOW:** Perennial, continuous.

**INSTRUMENTATION:** Runoff - 20.4 ft. wide by 1.55 ft. deep rectangular notch in concrete dam for flows less than about 0.04 inch per hour; for flows exceeding about 0.04 inch per hour the control is the rectangular notch combined with a concrete dam 52 ft. long. Precipitation - three recording stations.

**WATERSHED CONDITIONS:** Farm wood lots - 5%; cultivated - 33%, common rotation is corn, small grain and hay; pasture - 62%, usually good cover of native bluegrass combined with other grasses and clover. Conditions are consistent from year to year.

**GENERALLY REPRESENTS:** Complex land use practices in the Southern Appalachian Ridges and Valleys land resource area (N-128) and the Northern Appalachian Ridges and Valleys land resource area (S-147).

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

Blacksburg, Virginia Thorne Creek Watershed W-I

Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1957 P						4.65	4.47	1.46	8.90	1.62	4.16	2.91	28.17
Q						.50	.40	.30	.27	.25	.32	.52	2.56
1958 P	2.28	2.11	4.97	4.37	7.30	3.16	2.22	5.43	1.72	2.01	1.72	3.39	40.68
Q	1.08	.73	1.00	1.97	2.46	1.10	.58	.59	.35	.28	.27	.40	10.81
1959 P	1.64	1.00	2.91	4.21	2.67	.59	3.55	4.93	5.16	3.78	2.46	2.47	35.37
Q	.41	.20	.24	.52	.49	.28	.23	.27	.20	.21	.19	.31	3.55
Normal P	3.03	2.45	3.41	2.66	3.49	3.33	4.48	3.48	2.43	2.33	2.20	2.66	35.95

## ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Blacksburg, Virginia Thorne Creek Watershed W-I

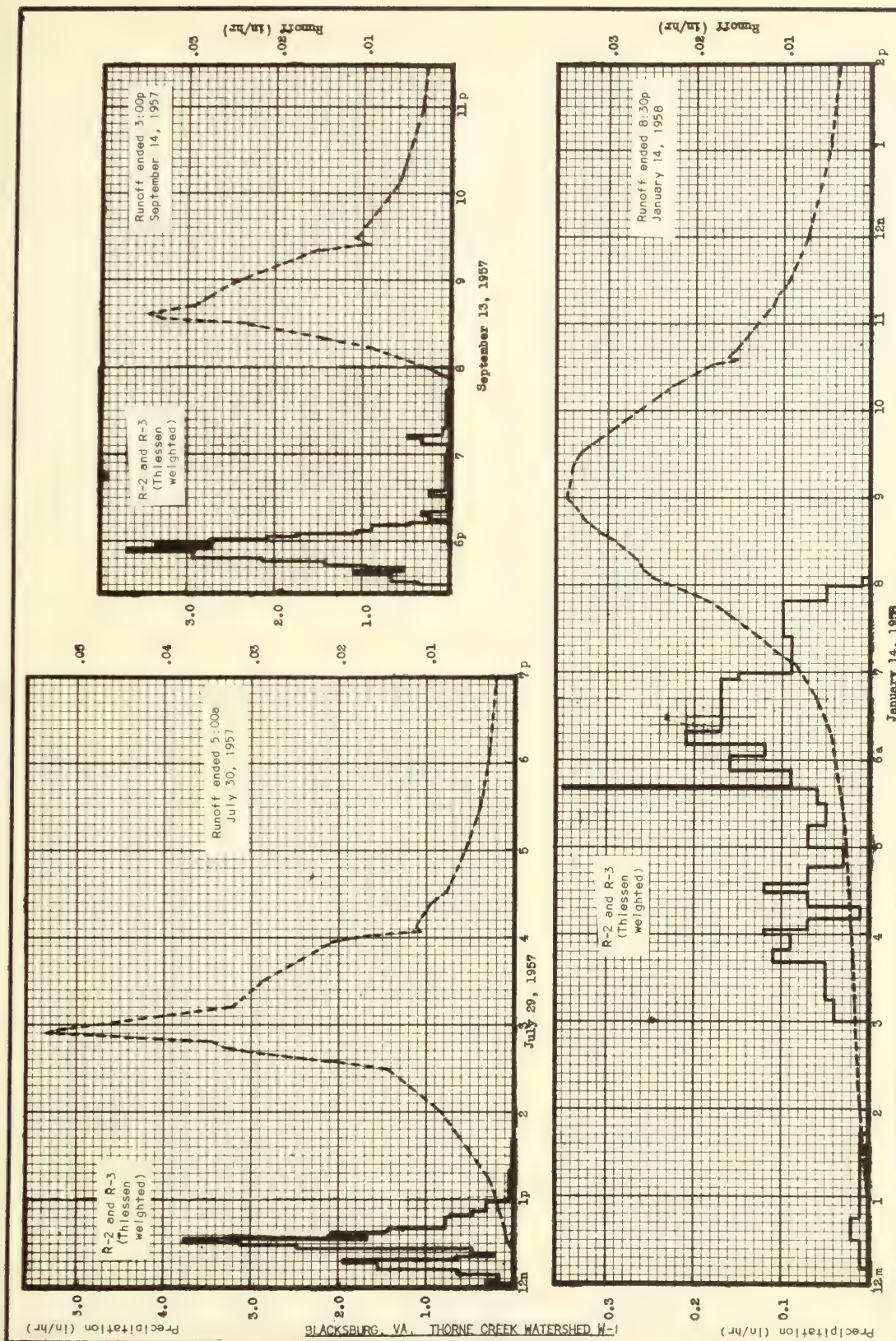
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	7-27	0.07	7-27	0.06	7-27	0.09	7-27	0.16	7-27	0.17	7-27	0.18	7-27	0.25	7-27	0.32
1958	5-17	.12	5-17	.10	5-17	.18	5-17	.30	5-17	.34	5-17	.38	5-17	.47	3-30	.93
1959	1-21	.01	1-21	.01	1-21	.02	1-21	.04	1-21	.05	1-21	.06	1-21	.07	1-17	.13

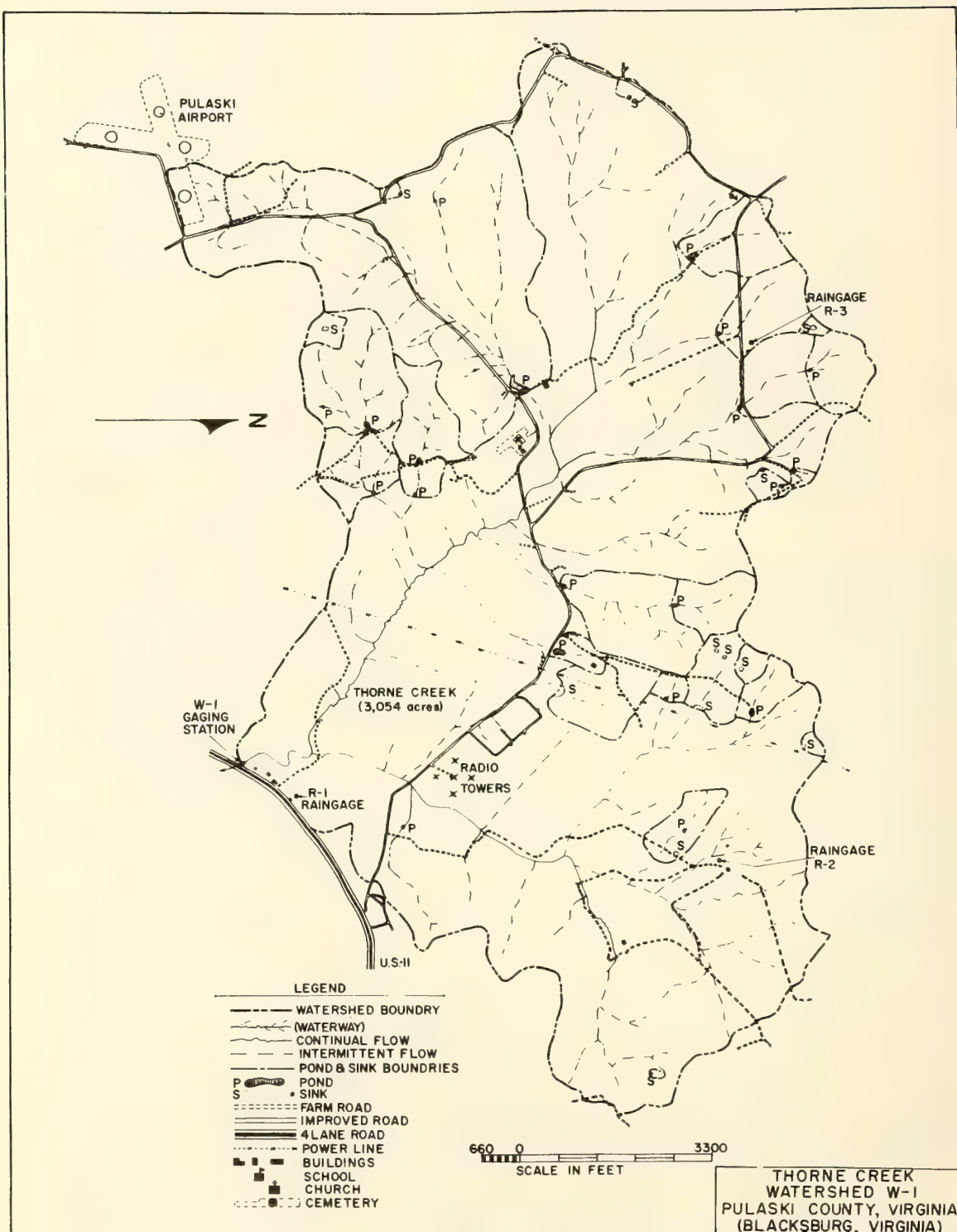
Notes: Records began 6-1-57. Quality of records: Monthly P - excellent, Q - fair; Annual Max. Discharges and Vols. - good. Normal P based on 53-yr. record (1907 - 1959) at Radford, Va. (Claytor Dam).

SELECTED RUNOFF EVENTS					Blacksburg, Virginia Thorne Creek Watershed W-I			
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 29-30, 1967								
6-28-57	0.74	0.0144	7-29-57	Rain gages	R-2 & R-3	7-29-57		
6-29	.05	.0120	12:03p	0	0	12:26p	0.0005	0
6-30	T	.0072	:05	.32	.01	:32	.0067	T
7-1, 12/	0	.0192	:09	.16	.02	:40	.0009	.0001
7-5	T	.0048	:12	.65	.05	1:14	.0027	.0011
7-6, 82/	C	.0144	:17	1.56	.18	:20	.0034	.0014
7-9	.63	.0052	:19	1.94	.25	:34	.0053	.0024
7-10, 142/	0	.0240	:21	.65	.27	2:00	.0082	.0053
7-15	.01	.0048	:23	.32	.28	:29	.0146	.0108
7-16	0	.0048	:27	.49	.32	:35	.0208	.0126
7-17	.63	.0048	:29	2.48	.40	:41	.0301	.0151
7-18	.04	.0036	:31	3.13	.50	:44	.0324	.0167
7-19, 222/	0	.0096	:33	3.77	.63	:48	.0348	.0189
7-23	.10	.0024	:35	1.67	.68	:55	.0532	.0241
7-24	T	.0024	:38	2.08	.78	:56	.0517	.0249
7-25, 262/	0	.0048	:40	1.43	.83	3:12	.0321	.0361
7-27	2.09	.1678	:48	.79	.94	:30	.0287	.0452
7-28	.05	.0180	:50	.71	.96	:36	.0205	.0559
7-29	0	.0096 3/	:52	.47	.78	4:02	.0150	.0577
			:59	.31	1.01	:05	.0105	.0583
Watershed Conditions:			1:28	.01	1.03	:08	.0110	.0589
As described under "Watershed Conditions" on page 13.6-1. Corn 3.5 to 4 ft. tall, small grain harvested.			:40	.01	1.03	:24	.0093	.0616
			Total Rainfall			:32	.0077	.0627
				R-2	.90	:44	.0069	.0642
				R-3	1.11	5:00	.0055	.0659
						:30	.0039	.0682
						6:06	.0028	.0703
						7:00	.0020	.0724
						:25	.0015	.0732
						8:00	.0012	.0739
						9:20	.0008	.0753
						11:30	.0007	.0769
						7-30-57		
						5:00a	.0006	.0804
Event of September 12-13, 1967								
8-14-57	T	0.0144	9-13-57	Rain gages	R-2 & R-3	9-13-57		
8-15	.46	.0144	5:30p	0	0	7:52p	0.0007	0
8-16, 172/	0	.0276	:32	.35	.01	8:00	.0027	.0002
8-18	.22	.0084	:37	.67	.07	:12	.0086	.0013
8-19	.10	.0072	:40	1.10	.12	:20	.0143	.0028
8-20	T	.0072	:42	.51	.14	:28	.0230	.0053
8-21, 242/	0	.0288	:44	.95	.17	:33	.0328	.0076
8-25	.05	.0060	:46	1.43	.22	:36	.0344	.0093
8-26, 9-12/	0	.0336	:48	2.14	.29	:40	.0291	.0115
9-2	.78	.0048	:53	2.94	.54	:46	.0277	.0143
9-3	.01	.0048	:55	3.69	.66	9:00	.0242	.0203
9-4, 62/	T	.0144	:57	2.72	.75	:20	.0149	.0269
9-7	.15	.0048	:59	3.37	.86	:24	.0093	.0277
9-8	.30	.0048	6:01	2.72	.95	:28	.0109	.0284
9-9	.71	.0048	:03	2.07	1.02	:54	.0080	.0318
9-10	.09	.0048	:05	1.74	1.08	10:08	.0057	.0339
9-11	.06	.0048	:07	1.06	1.12	11:00	.0031	.0377
9-12	T	.0048	:11	.90	1.18	12:00m	.0020	.0403
9-13	0	.0089 4/	:13	.46	1.19	9-14-57		
			:15	.01	1.19	2:00a	.0009	.0433
Watershed Conditions:			:18	.23	1.20	5:00	.0006	.0455
As described under "Watershed Conditions" on page 13.6-1. Corn mature.			:20	.33	1.21	9:00	.0004	.0474
			:32	.01	1.22	3:00p	.0003	.0496
			:35	.23	1.23			
			7:00	.04	1.24			
Notes: To convert runoff in in/hr to cfs, multiply by 3079.4								
1/ All rainfall Thiessen weighted amounts - Antecedent Rainfall for rain gages R-1, R-2, R-3 and Pulaski CAA AP daily precipitation; Main Event Rainfall for rain gages R-2 and R-3.								
2/ Inclusive dates. 3/ Prior to 12:26p. 4/ Prior to 7:52p.								

SELECTED RUNOFF EVENTS						Blacksburg, Virginia Thorne Creek Watershed W-I		
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 13-14, 1957 - Continued								
			:07	.01	1.25			
			:11	.33	1.27			
			:13	.50	1.29			
			:18	.07	1.29			
			:30	.03	1.30			
			:45	.03	1.31			
				Total	Rainfall			
				R-2	1.00			
				R-3	1.62			
Event of January 14, 1958								
12-15-57	0	0.0156	1-14-58	Rain gages	R-2 & R-3	1-14-58		
12-16	T	.0144	12:10a	0	0	1:00a	0.0011	0
12-17	T	.0144	:30	.01	0	2:20	.0012	.0007
12-18	.01	.0144	:45	.02	.01	:55	.0014	.0015
12-19	.34	.0144	1:44	.01		3:40	.0017	.0026
12-20	.47	.0176	3:00	0	.02	4:18	.0020	.0038
12-21, 24 <sup>2/</sup>	T	.0612	:15	.04	.03	:46	.0023	.0048
12-25	.34	.0147	:40	.05	.05	5:10	.0026	.0058
12-26	.68	.0328	:50	.11	.07	:30	.0029	.0067
12-27	0	.0216	4:00	.09	.08	:46	.0034	.0076
12-28	T	.0204	:03	.12	.09	6:00	.0037	.0084
12-29, 30 <sup>2/</sup>	0	.0348	:10	.07	.10	:14	.0040	.0093
12-31, 1-2-58 <sup>3/</sup>	T	.0504	:20	.01	.10	:24	.0046	.0101
1-3, 6 <sup>2/</sup>	0	.0672	:28	.07	.11	:32	.0049	.0107
1-7, 9 <sup>2/</sup>	T	.0504	:35	.12	.12	:40	.0056	.0114
1-10, 12 <sup>2/</sup>	0	.0540	:46	.07	.13	7:06	.0088	.0145
1-13	.74	.0201	5:00	.03	.14	:16	.0110	.0161
1-14	0	.0011 <sup>3/</sup>	:15	.07	.16	:24	.0127	.0177
			:30	.05	.17	:42	.0166	.0221
			:40	.06	.18	:50	.0188	.0244
			:42	.35	.19	8:04	.0243	.0295
			:52	.09	.21	:10	.0258	.0320
			6:03	.16	.24	:16	.0262	.0346
			:10	.12	.25	:30	.0291	.0410
			:20	.21	.29	:34	.0306	.0430
			:30	.17	.31	:38	.0310	.0451
			:45	.17	.36	:44	.0324	.0482
			:55	.17	.38	:52	.0336	.0526
			:59	.15	.39	:58	.0347	.0561
			7:25	.09	.43	9:05	.0345	.0601
			:50	.10	.48	:12	.0342	.0641
			:59	.05	.48	:20	.0341	.0687
			8:05	.01	.49	:30	.0333	.0743
						:38	.0319	.0787
				Total	Rainfall	10:15	.0230	.0956
				R-2	.55	:32	.0180	.1013
				R-3	.47	:35	.0156	.1022
						:37	.0161	.1027
						:40	.0156	.1036
						:54	.0134	.1069
						11:14	.0109	.1110
						:28	.0096	.1134
						:45	.0082	.1159
						12:00n	.0071	.1178
						:22 p	.0059	.1202
						:44	.0050	.1222
						1:04	.0046	.1238
						:24	.0041	.1252
						:46	.0037	.1266
						2:46	.0029	.1300
						3:42	.0025	.1325
						5:00	.0022	.1357
						8:30	.0019	.1429
<p>Notes: To convert runoff in in/hr to cfs, multiply by 3079.4</p> <p>1/ All rainfall Thiessen weighted amounts - Antecedent Rainfall for rain gages R-1, R-2, R-3 and Pulaski CAA AP daily precipitation; Main Event Rainfall for rain gages R-2 and R-3.</p> <p>2/ Inclusive dates. 3/ Prior to 1:00a.</p>								







BLACKSBURG, VA. Brush Creek Watershed W-I

LOCATION: Floyd County, Va.; 1 mi. W. of Terrys Fork, Va., Little River, New River.

AREA: 893 acres (1.40 sq. mi.)

SHAPE: Roughly fan or leaf shaped, about 1.62 mi. by 0.88 mi.

SLOPES: 10% is in 2-7%; 36% is in 7-15%; 35% is in 15-25%; 16% is in 25-45%; 3% is 45% (+). Aspect N.

SOILS: Based on 68% (mapped portion) of total area: parent material - igneous and metamorphic rocks. Watauga silt loam, 20 to 36 in. deep - 67%; Talladega silt loam, 10 to 20 in. deep - 20%; Tusquitee loam, 36 to 60 in. deep - 5% and Wehakee silt loam and Hayesville loam, 36 to 60 in. deep - 7%. All are medium texture with moderate to rapid permeability.

EROSION: 1 - 19%; 2 - 72%; 3 - 9%.

LAND CAPABILITY: II - 3%; III - 35%; IV - 38%; VI - 8%; VII - 18%

SURFACE DRAINAGE: Good, principal waterway - 1.44 mi. Area is composed of three sub areas with the confluence of the three streams about 1000 ft. above gaging station.

CHARACTER OF FLOW: Perennial, continuous.

INSTRUMENTATION: Runoff - 10 ft. x 10 ft. concrete, box type highway culvert modified with Virginia broad-crest V-notch weir, 24 hr. chart. Precipitation - two recording stations, one with a weekly chart and one with 12 hr. chart.

WATERSHED CONDITIONS: Farm woods, a mixture of hardwoods and conifers - 29%; pasture - 60%, cultivated - 11%, in a common rotation of corn, small grain and hay. Very few soil conservation practices have been applied to area.

GENERALLY REPRESENTS: Mixed cover conditions in the Blue Ridge land resource area (N-130).

**MONTHLY PRECIPITATION AND RUNOFF (Inches)**

Blacksburg, Virginia Brush Creek Watershed W-I

Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1957	P								2.99	9.01	2.35	3.62	2.89	20.46
	Q								1.24	2.64	1.93	2.36	2.62	10.79
1958	P	2.34	2.51	3.25	3.33	4.90	2.64	2.37	2.97	1.30	1.48	1.57	5.72	34.39
	Q	2.32	3.09	2.98	2.88	2.13	1.01	.92	.96	.79	.90	.92	2.67	22.03
1959	P	1.76	1.35	2.52	3.11	5.00	2.14	6.35	4.90	10.36	5.48	2.32	2.64	49.93
	Q	1.46	1.11	1.29	2.62	1.84	1.34	2.43	1.05	3.84	3.30	1.99	2.42	23.20
Normal P		2.95	2.91	3.34	3.15	4.49	4.22	4.87	3.83	3.02	2.75	2.27	2.95	40.79

**ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS**

Blacksburg, Virginia Brush Creek Watershed W-I

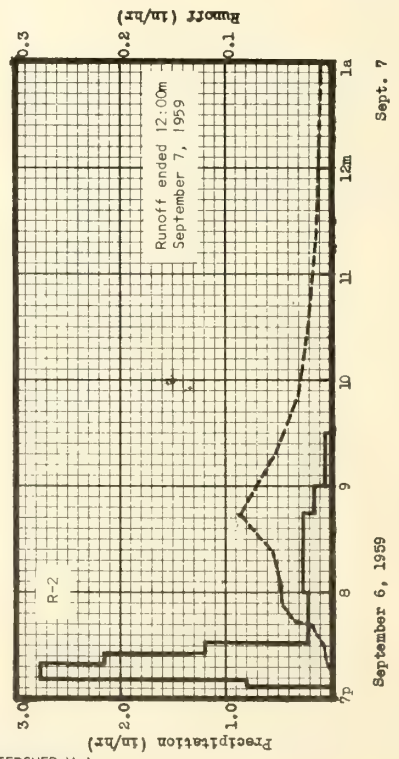
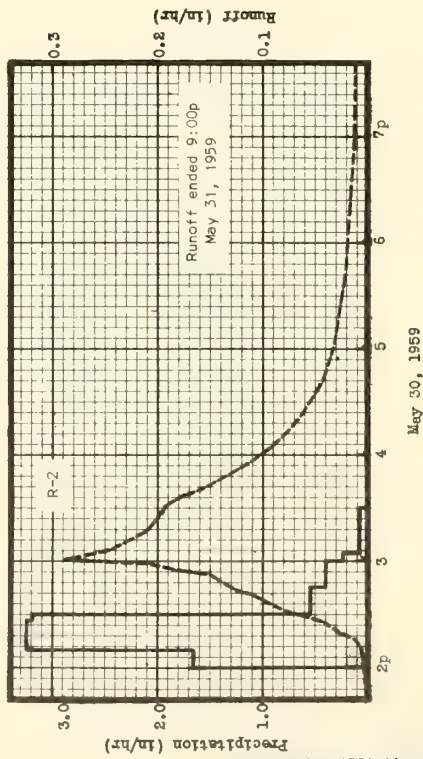
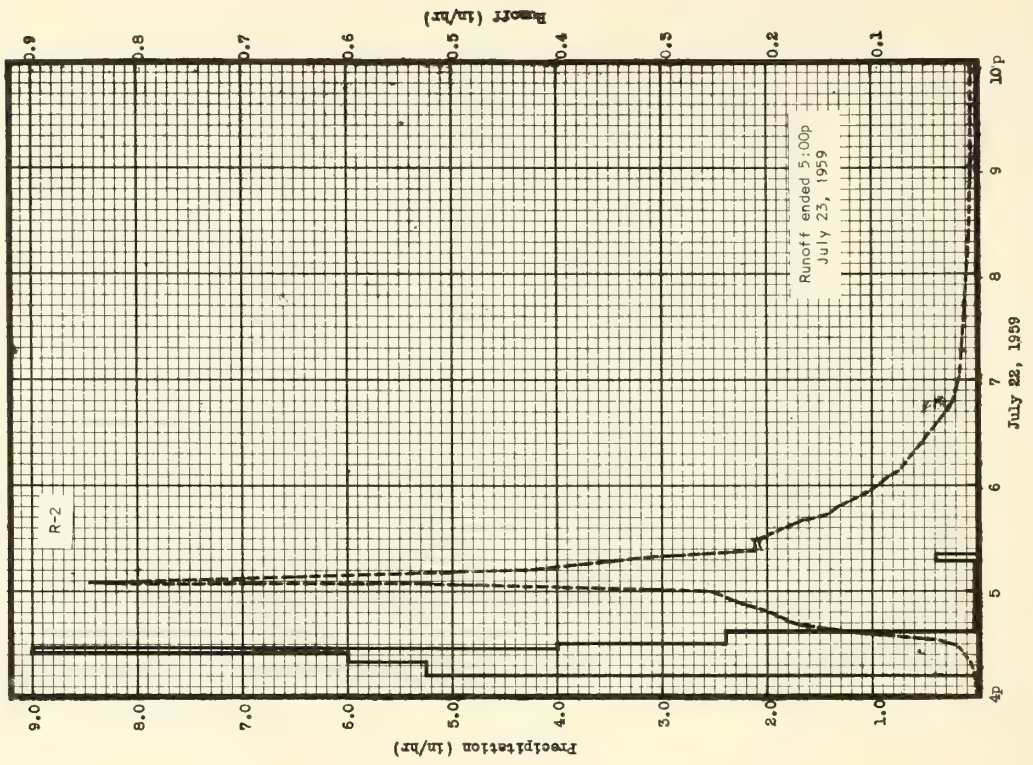
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	9-17	0.09	9-17	0.08	9-17	0.16	9-17	0.41	9-17	0.54	9-16	0.78	9-16	0.99	9-14	1.45
1958	12-29	.15	12-28	.14	12-28	.29	12-28	.80	12-28	1.34	12-28	1.64	12-28	1.19	12-23	2.01
1959	9-30	1.16	9-30	.62	9-30	.91	9-30	1.62	9-30	2.17	9-29	2.59	9-29	2.81	9-29	3.23

Notes: Records began 8-1-57. Quality of records: Monthly P - excellent; Q - fair prior to June, 1959, then good; Annual Max. Discharges and Vols. - good. 1/ Partially estimated due to ice formation. Normal P based on 67-yr. record (1893 - 1959) at Blacksburg, Va.



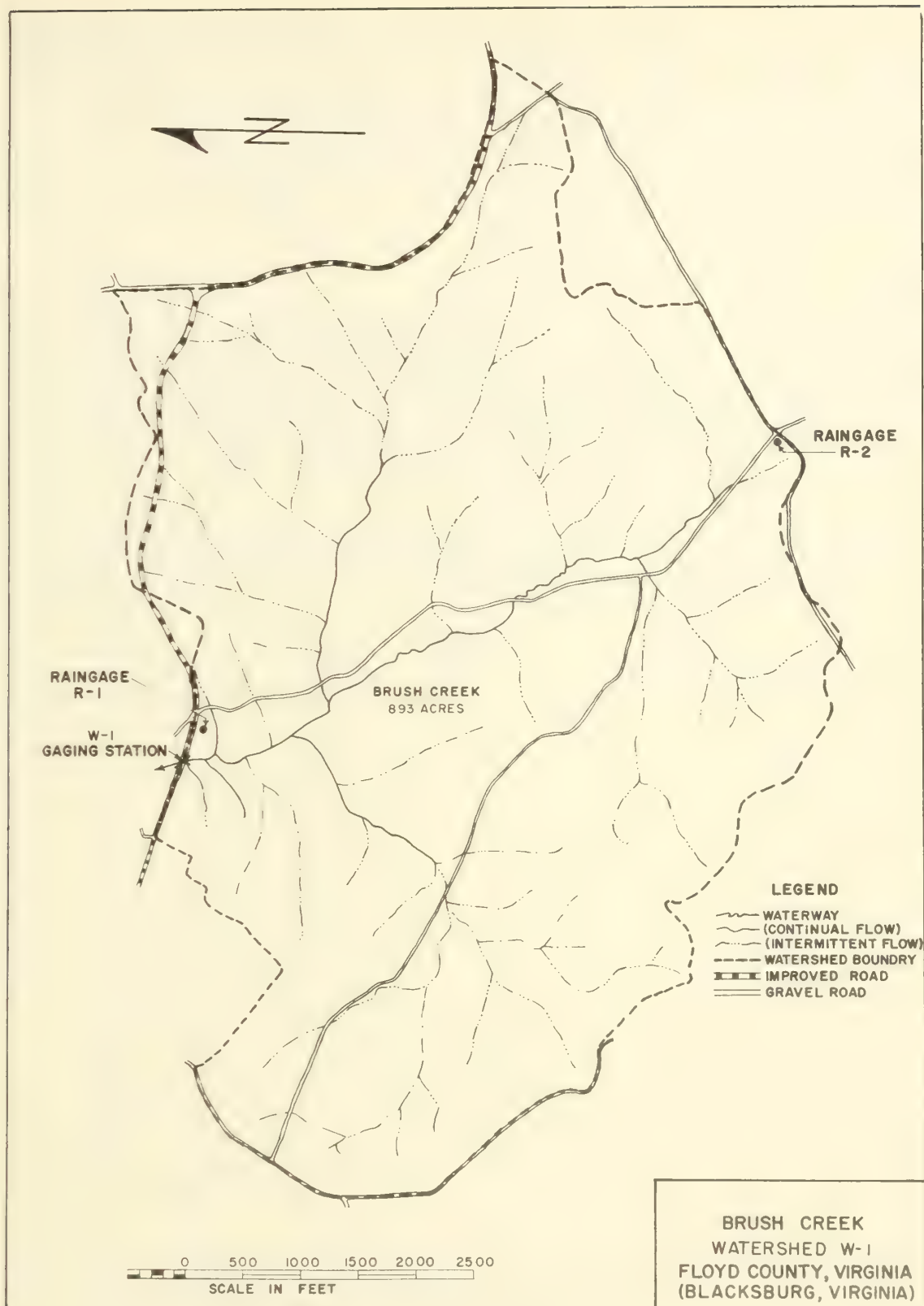
SELECTED RUNOFF EVENTS						Blacksburg, Virginia Brush Creek Watershed W-I		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 30-31, 1959								
4-30-59	0.03	0.0402	5-30-59	Raingage	R-2	5-30-59		
5-1	.01	.0443	2:00p	0	0	1:44p	0.0015	0
5-2	0	.0393	:10	1.68	.28	:54	.0022	.0002
5-3	0	.0369	:27	3.24	1.20	2:00	.0026	.0004
5-4	.61	.0573	:30	3.20	1.36	:12	.0079	.0014
5-5	0	.0482 <sup>5/</sup>	:45	.56	1.50	:16	.0142	.0022
5-6,9 <sup>2/</sup>	0	.2066 <sup>5/</sup>	3:00	.40	1.60	:18	.0193	.0027
5-10	.01	.0516 <sup>5/</sup>	:05	.24	1.62	:20	.0279	.0035
5-11,12 <sup>2/</sup>	0	.1033 <sup>5/</sup>	:30	.09	1.66	:24	.0380	.0056
5-13	.59	.0516 <sup>5/</sup>				:28	.0603	.0089
5-14	.01	.0516 <sup>5/</sup>				:32	.0811	.0136
5-15,16 <sup>2/</sup>	0	.0625 <sup>5/</sup>				:35	.0919	.0179
5-17	.01	.0320				:40	.1104	.0263
5-18	.06	.0320				:44	.1293	.0343
5-19	0	.0320				:52	.1531	.0532
5-20	.39	.0393				:56	.1916	.0646
5-21	.05	.0393				:58	.2111	.0714
5-22,25 <sup>2/</sup>	0	.1204				3:00	.2552	.0792
5-26	.02	.0295				:01	.2874	.0837
5-27	1.19	.1286				:04	.2682	.0976
5-28	.04	.0497				:06	.2544	.1063
5-29	.01	.0393				:16	.2167	.1456
5-30	0	.0206 <sup>3/</sup>				:32	.1972	.2008
						:38	.1778	.2196
						:40	.1635	.2253
						:48	.1417	.2456
						:56	.1182	.2629
						4:04	.0955	.2772
						:08	.0884	.2833
						:20	.0701	.2992
						:40	.0466	.3186
						5:00	.0325	.3319
						:40	.0216	.3499
						6:48	.0142	.3522
						8:00	.0115	.3677
						9:00	.0095	.3782
						11:00	.0077	.3954
						12:00m	.0072	.4028
						5-31-59		
						5:00a	.0051	.4335
						12:36p	.0040	.4677
						9:00	.0033	.4987
Event of July 22-23, 1959								
6-22-59	0	0.0295	7-22-59	Raingage	R-2	7-22-59		
6-23	.78	.0635	4:12p	0	0	4:00p	0.0012	C
6-24	.20	.0401	:20	5.25	.70	:12	.0020	.0002
6-25,7-10 <sup>2/</sup>	0	.3805	:25	6.00	1.20	:20	.0072	.0008
7-11	.01	.0221	:27	9.00	1.50	:24	.0120	.0014
7-12	0	.0221	:30	4.00	1.70	:28	.0182	.0024
7-13	.30	.0236	:37	2.40	1.98	:32	.0370	.0043
7-14	.09	.0328	5:17	.03	2.00	:33	.0498	.0050
7-15,18 <sup>2/</sup>	0	.0959	:20	.40	2.02	:35	.0699	.0070
7-19	.35	.0253				:36	.1072	.0084
7-20	.68	.0446				:40	.1715	.0177
7-21	1.04	.0906				:44	.1849	.0296
7-22	0	.0244 <sup>4/</sup>				:48	.2034	.0425
						:52	.2302	.0570
						:56	.2412	.0726
						5:00	.2595	.0893
						:04	.5357	.1159
						:05	.8471	.1274
						:12	.4414	.2026
						:20	.3250	.2537
Watershed Conditions:								
As described under "Watershed Conditions" on page 13.8-1.								
Corn planted, some up 2 in. high.								
Small grain 20 to 35 in., Hay 11 to 20 in. high.								
Watershed Conditions:								
As described under "Watershed Conditions" on page 13.8-1.								
Corn 6 to 7 ft.; small grain harvested.								
Notes: To convert runoff in in/hr to cfs, multiply by 900.43								
1/ Antecedent Rainfall Thiessen weighted (R <sub>1</sub> & R <sub>2</sub> gages).								
2/ Inclusive dates. 3/ Prior to 1:44p. 4/ Prior to 4:00p.								
5/ Ant. Runoff estimated from 5-5-59 at 11:00a to 5-15 at 2:30p - gage not in operation - weir under construction.								

SELECTED RUNOFF EVENTS						Blacksburg, Virginia Brush Creek Watershed W-I		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 22-23, 1959 - Continued								
						5:22p	.2373	.2630
						:24	.2104	.2705
						:28	.2137	.2846
						:32	.2076	.2987
						:36	.1930	.3120
						:40	.1726	.3242
						:44	.1450	.3347
						:48	.1347	.3441
						:56	.1120	.3770
						6:04	.0876	.3903
						:08	.0765	.3957
						:24	.0550	.4132
						:36	.0378	.4225
						:44	.0274	.4268
						7:00	.0193	.4331
						:16	.0148	.4393
						:44	.0108	.4453
						8:20	.0080	.4509
						9:12	.0061	.4571
						10:40	.0046	.4595
						12:00m	.0040	.4653
						7-23-59		
						3:00a	.0031	.4757
						2:00p	.0015	.5005
						5:00	.0014	.5048
Event of September 1-2, 1959								
8-7-59	0	.0320	9-6-59	R <sub>1</sub> .24p	R-2	9-6-59	0.0017	0
8-8	.01	.0295	7:07p	0		7:10p	.0024	.0001
8-9, 14 <sup>2</sup>	0	.1413	:10	.80	.04	:20	.0066	.0008
8-15	.02	.0197	:20	2.76	.07	:30	.0134	.0018
8-16	0	.0210	:25	2.16	.06	:35		
8-17	.23	.0202	:32	1.20	.82	:40	.0179	.0029
8-18	.02	.0267	8:00	.21	.92	:44	.0329	.0045
8-19, 20 <sup>2</sup>	0	.0393	:04	.24	1.10	:48	.0442	.0096
8-21	.09	.0205	9:00	.16	1.14	8:04	.0476	.0188
8-22	.02	.0197	:30	.04	1.16	:22	.0567	.0345
8-23	0	.0211				:36	.0789	.0526
8-24	.28	.0257				:44	.0662	.0609
8-25, 26 <sup>2</sup>	0	.0393				9:16	.0537	.0902
8-28	.01	.0221				:48	.0326	.1211
8-29	1.20	.0469				10:24	.0230	.1378
8-30	.15	.0469				11:17	.0148	.1544
8-31	1.44	.1608				12:00m	.0115	.1638
9-1	.48	.0788				9-7-59		
9-2, 4 <sup>2</sup>	0	.0950				2:20a	.0070	.1854
9-3	.26	.0338				5:40	.0051	.2015
9-4	.32	.0429				11:00	.0037	.2244
						12:00p	.0028	.2498
						12:00m	.0026	.2675
Watershed Conditions:								
As described under "Watershed Conditions" on page 13.8-1.								
Storm mature.								
Notes: 1. To convert runoff in inches to cfs, multiply by 906.43								
Antecedent Rainfall Thresholds weighted (R <sub>1</sub> & R <sub>2</sub> ranges).								
Inclusive dates.								
Rainfall prior to 4:04p, runoff prior to 7:10p.								



BLACKSBURG, VIRGINIA BRUSH CREEK WATERSHED W-1





MONTHLY PRECIPITATION AND RUNOFF (Inches)								Staunton, Virginia Bell Creek Watershed W-III Area - 6,144 acres (9.60 sq. mi.)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1955 <u>1</u> / P	0.34	2.60	3.85	2.24	2.33	3.90	3.65	7.38	1.79	0.78	1.82	0.49	31.17			
Q	.20	.29	.52	.16	.09	.13	.08	.69	.11	.08	.07	.05	2.47			
1956 P	1.40	3.45	3.03	1.61	1.09	2.28	4.69	3.92	4.60				26.07			
Q	.04	.13	.23	.13	.05	.03	.02	.01	.01 <u>2</u> / .				.65			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS <u>3</u> /								Staunton Virginia Bell Creek Watershed W-III								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1955	8-18	0.10	8-18	0.09	8-18	0.15	8-17	0.27	8-17	0.37	8-17	0.44	8-17	0.48	8-17	0.59
1956	3-15	T	3-14	T	3-14	.01	3-14	.01	3-14	.02	3-14	.03	3-14	.05	3-14	.12
Notes: Quality of records: Monthly Precipitation - good; monthly Q - fair. Precipitation data taken from USWB Climatological Data as given for Staunton D. & B. Institution, Staunton, Va. Runoff data taken from USGS Water Supply Papers 1382 & 1432. <u>1</u> / To complete the calendar year, Jan. to Sept. monthly values were repeated from "Monthly Precipitation and Runoff from Small Agricultural Watersheds in the United States", June 1957. <u>2</u> / Runoff station discontinued 9-30-56. <u>3</u> / Data repeated from "Annual Maximum Flows from Small Agricultural Watersheds in the United States", June 1958.																

Cooperative Research Project of USDA, USGS, and Virginia Agricultural Research Station.





MONTHLY PRECIPITATION AND RUNOFF (Inches)								East Lansing, Michigan Watershed A (Area - 1.98 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P	0.48	1.92	2.41	3.99	6.26	2.80	2.54	5.20	0.63	0.26	1.51	1.26	29.26			
Q	0	1.63	3.65	.06	.48	0	0	.48	0	0	0	0	6.30			
1957 P	1.31	1.10	1.81	3.86	6.12	2.42	7.22	1.55	1.28	3.84	2.43	2.86	35.80			
Q	.11	1.00	.32	0	.01	0	.92	0	0	0	0	0	2.36			
1958 P	1.57	.78	.27	1.56	1.34	2.32	4.31	3.24	2.54	1.85	1.35	.32	21.45			
Q	0	.16	0	0	0	0	0	0	0	0	0	0	.16			
1959 P	2.32	1.98	1.95	4.10	2.99	1.60	5.67	5.13	3.31	5.24	2.79	1.92	39.00			
Q	.02	.58	5.31	0	0	0	T	T	0	.01	0	0	5.92			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								East Lansing, Michigan Watershed A								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	7-11	3.13	7-11	0.39	7-11	0.58	7-11	0.69	7-11	0.69	2-8	0.86	2-8	0.89	7-4	0.91
1958	2-25	.03	2-25	.02	2-25	.04	2-25	.06	2-24	.11	2-24	.16	2-24	.16	2-24	.16
1959	7-23	.85	3-15	.27	3-15	.44	3-15	.86	3-15	1.28	3-14	1.38	3-14	1.53	2-27	2.71
Notes: Quality of records: excellent. Watershed conditions: 1957, 1958 and 1959 - corn. Corrections: Q - 1948, February 2.29, Total 4.21. Q - 1950, February 0.96, March 3.90. Q - 1951, February 2.27, Total 2.48.																
SELECTED RUNOFF EVENTS								East Lansing, Michigan Watershed A								
Antecedent conditions				Rainfall						Runoff						
Date	Rainfall (inches)		Runoff (inches)		Date and time		Intensity (in/hr)		Acc. (inches)		Date and time		Rate (in/hr)		Acc. (inches)	
Event of March 5, 1959																
2-5-59	0.04 s		0		3-5-59		Raingage		Cult.		3-5-59					
2-9	.30 rs		0		9:32p		0		0		12:26p		0		0	
2-10	.47 rs		0		:42		.12		.02		:30		.0011		0	
2-11	.08 rs		0		:56		.09		.04		3:30		.0037		.0059	
2-12	.09		0													
2-13	.02		.11		11:04		.04		.09		:50		.0053		.0074	
2-14	.28		.19		:32		0		.09		4:30		.0053		.0110	
2-15	T rs		.07		:42		.18		.12		9:40		.0023		.0262	
2-18	.10		0		12:00		.03		.13		10:20		.0144		.0308	
2-21	T s		0		3-6-59						:42		.0306		.0388	
2-23	.34 rs		.03		12:10a		0		.13		11:00		.0384		.0492	
2-24	0		.06		:24		.13		.16		:30		.0471		.0706	
2-26	.06 rs		T		:36		0		.16		3-6-59					
2-27	T		.04		1:02		.07		.19		12:40a		.1172		.1678	
2-28	0		.09		:12		.30		.24		1:06		.1172		.2186	
3-1	0		.36		:18		0		.24		:18		.1483		.2452	
3-2	T		.46		:26		.23		.27		:31		.1653		.2791	
3-3	.02 s		.40		:36		0		.27		2:00		.1828		.3625	
3-4	0		.17		:38		.30		.28		:10		.1828		.3930	
3-5	.03		.02		:44		0		.28		:28		.1653		.4451	
					2:36		.08		.35		3:00		.1923		.5400	
					3:46		.13		.50		:20		.1923		.6041	
					4:08		.03		.51		:30		.2019		.6370	
					:24		.08		.53		:36		.2019		.6571	
					7:00		.01		.55		5:12		.0781		.8713	
Notes: To convert runoff in in/hr to cfs, multiply by 2.00. On March 3, 1959 there was about 3 inches of water stored on the surface of the watershed in the form of snow and ice.																

Cooperative Research Project of USDA and Michigan Agricultural Experiment Station

SELECTED RUNOFF EVENTS					East Lansing, Michigan		Watershed A	
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of March 5, 1959 - Continued								
			7:24a	0.05	0.57	5:46a	0.0566	0.9092
						7:00	.0344	.9637
						8:00	.0306	.9962
						10:06	.0174	1.0463
						2:30p	.0072	1.1002
<u>Watershed conditions:</u> Corn stubble with rye grass winter cover crop. Surface soil frozen.						3:20	.0072	1.1062
						4:00	.0037	1.1099
						:16	.0072	1.1114
						:50	.0306	1.1219
						5:22	.0236	1.1363
						:38	.0236	1.1426
						6:38	.0072	1.1573
						8:06	.0011	1.1620
						11:00	.0053	1.1720
						12:00	.0023	1.1758
						3-7-59		
						12:44a	(	1.1770
Event of March 14, 1959								
2-14-59	0.28	0.19	3-14-59	Raingage	Cult.	3-14-59		
2-15	T rs	.07	9:00p	0	0	7:36p	0	0
2-18	.10 s	0	10:00	.02	.02	8:40	.0011	.0008
2-21	T s	0	:08	.30	.06	10:00	.0011	.0022
2-23	.34 rs	.03	11:04	.04	.12	:48	.0053	.0048
2-24	0	.06	:22	0	.12	11:26	.0269	.0145
2-26	.06 rs	T	:36	.13	.15	3-15-59		
2-27	T	.04	12:00	.02	.16	12:12a	.0426	.0415
2-28	0	.09	3-15-59			:22	.0566	.0496
3-1	0	.36	12:22a	.22	.24	:36	.0972	.0677
3-2	T	.46	:30	0	.24	:59	.1322	.1111
3-3	.02 s	.40	:50	.09	.27	1:07	.1322	.1287
3-4	0	.17	1:52	0	.27	:30	.0972	.1719
3-5	.16	.12	2:42	.02	.29	2:16	.0616	.2314
3-6	.45	1.07	3:20	0	.29	:34	.0566	.2491
3-7	0	T	4:34	.01	.30	3:26	.0566	.2981
3-8	.07 s	.03	5:32	0	.30	4:16	.0781	.3543
3-9	T s	0	6:48	.06	.37	:26	.0907	.3684
3-12	T s	0	7:56	0	.37	:42	.0907	.3926
3-13	.02 s	0	8:12	.49	.50	:52	.0972	.4082
			:20	.08	.51	5:54	.1172	.5164
						6:10	.1322	.5496
						:28	.1483	.5917
						:39	.1923	.6229
						:42	.1828	.6322
						7:00	.2019	.6896
						:32	.1483	.7814
						:50	.1483	.8259
						8:03	.2019	.8622
						:11	.3106	.8957

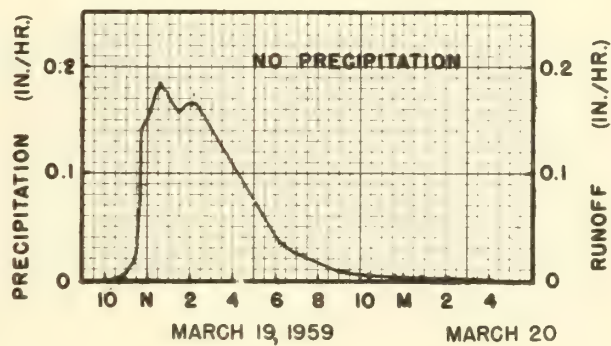
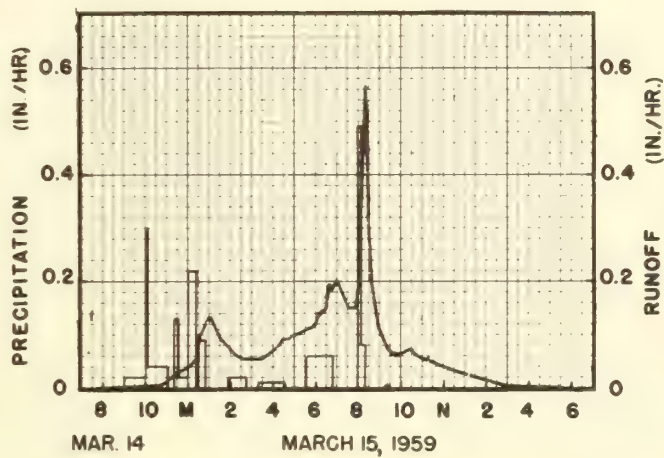
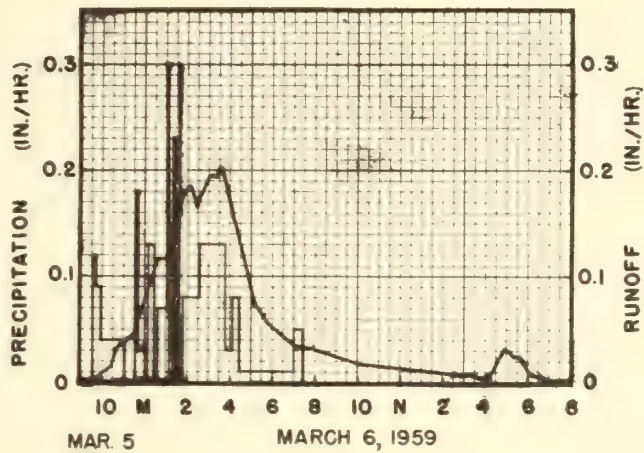
Notes: To convert runoff in in/hr to cfs, multiply by 2.00. On March 3, 1959 there was about 3 inches of water stored on the surface of the watershed in the form of snow and ice.

Notes: To convert runoff in in/hr to cfs, multiply by 2.00. On March 3, 1959 there was about 3 inches of water stored on the surface of the watershed in the form of snow and ice.

SELECTED RUNOFF EVENTS						East Lansing, Michigan Watershed A		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of March 14, 1959 - Continued</u>								
Watershed conditions: Corn stubble with rye grass winter cover crop. Surface soil frozen.						8:21a	0.5610	0.9603
						:25	.4468	.9942
						:30	.3231	1.0254
						:40	.2019	1.0681
						:57	.1172	1.1117
						9:20	.0781	1.1488
						:34	.0671	1.1658
						:42	.0616	1.1743
						:54	.0616	1.1867
						10:20	.0726	1.2158
						:30	.0726	1.2279
						:32	.0671	1.2303
						11:04	.0566	1.2633
						:12	.0566	1.2708
						12:16p	.0384	1.3209
						2:30	.0093	1.3754
						3:00	.0037	1.3787
						:40	.0023	1.3807
						5:37	0	1.3839
<u>Event of March 19, 1959</u>								
2-21-59	T s	0		Raingage	Cult.	3-19-59		
2-23	.34 rs	.03				10:21a	0	0
2-24	0	.06				:56	.0053	.0015
2-26	.06 rs	T				11:22	.0174	.0060
2-27	T	.04				:28	.0236	.0081
2-28	0	.09				:40	.0781	.0161
3-1	0	.36				:45	.1403	.0259
3-2	T	.46				:51	.1483	.0403
3-3	.02 s	.40		No precipitation		12:06p	.1568	.0784
3-4	0	.17				:24	.1738	.1279
3-5	.16	.12				:40	.1828	.1754
3-6	.45	1.07				1:28	.1568	.3111
3-7	0	T				:50	.1653	.3702
3-8	.07 s	.03				2:16	.1653	.4418
3-9	T a	0				6:10	.0384	.8302
3-12	T s	0				:50	.0269	.8520
3-13	.02 s	0				9:00	.0093	.8882
3-14	.15	.03				10:00	.0053	.8955
3-15	.39 rs	1.35				11:40	.0037	.9030
3-16	0	.15				3-20-59		
3-17	.09 s	T				1:00a	.0023	.9076
3-18	0	.02				3:16	.0011	.9115
3-19	0	T				:40	.0023	.9122
						4:19	0.	.9132
Watershed conditions: Corn stubble with rye grass winter cover crop. Surface soil frozen.								

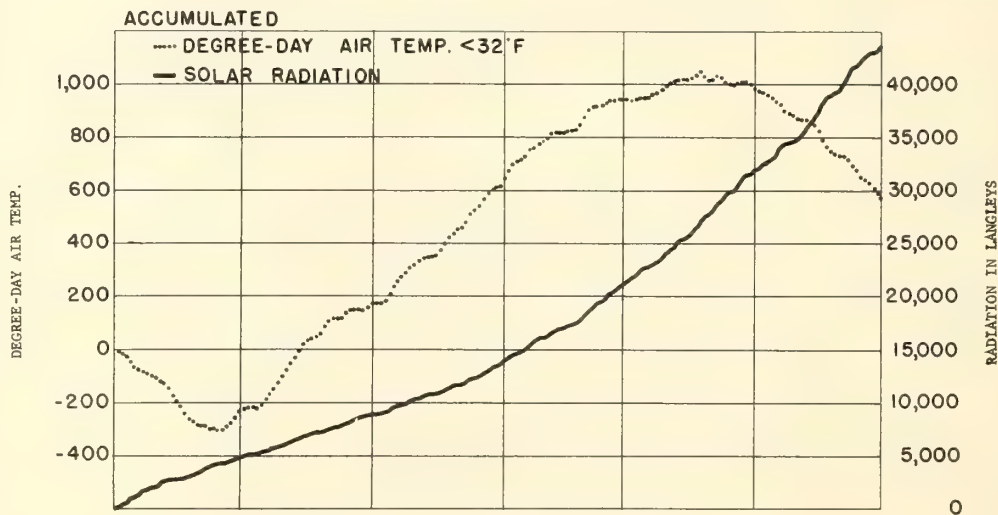
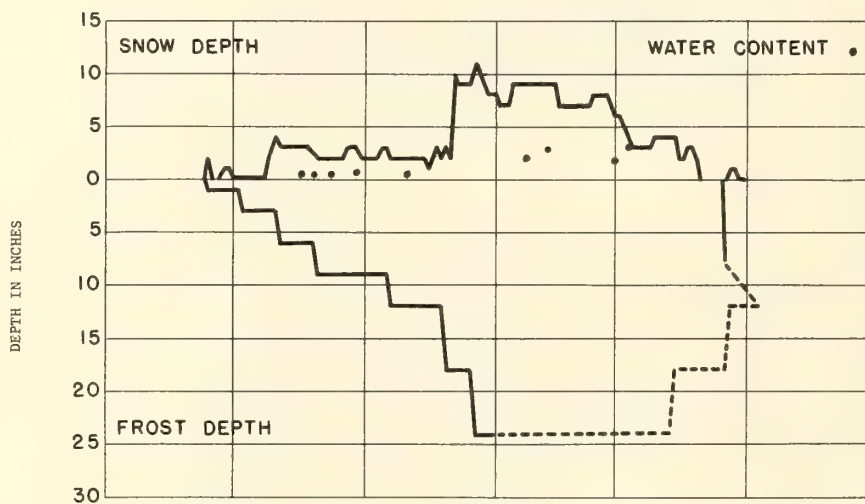
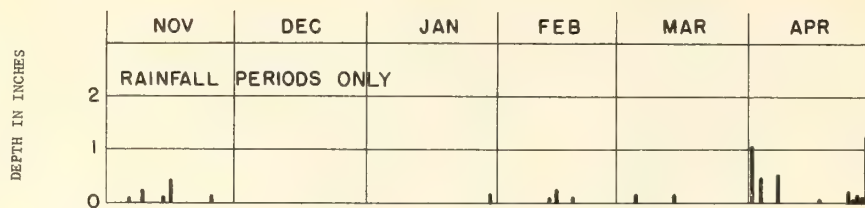
Notes: To convert runoff in in/hr to cfs, multiply by 2.00. On March 3, 1959 there was about 3 inches of water stored on the surface of the watershed in the form of snow or ice.





EAST LANSING, MICHIGAN WATERSHED A

1959



EAST LANSING, MICHIGAN WATERSHED A

## SLOPE DATA

AVERAGE SLOPE OF WATERSHED  
AVERAGE SLOPE OF WATERWAY

## WATERSHED

A	B
6.0%	6.5%
4.0%	5.2%

N

◦ (CULT.)



## SOIL LEGEND

233 SPINKS FINE SANDY LOAM  
235 SPINKS LOAMY FINE SAND  
430 HILLSDALE FINE SANDY LOAM  
434 TUSCOLA FINE SANDY LOAM

NOTE: ALL THE ABOVE SOILS HAVE RAPID  
INTERNAL DRAINAGE.

## LEGEND

◦ RECORDING RAINGAGE (CULT.)  
◻ HYGROTHERMOGRAPH  
◻ PYRHELIOMETER, AND SOIL  
TEMPERATURE AND MOISTURE  
DETERMINATION CENTER  
◻ RUNOFF AND EROSION  
MEASURING STATION

EAST LANSING, MICHIGAN  
WATERSHEDS A & B



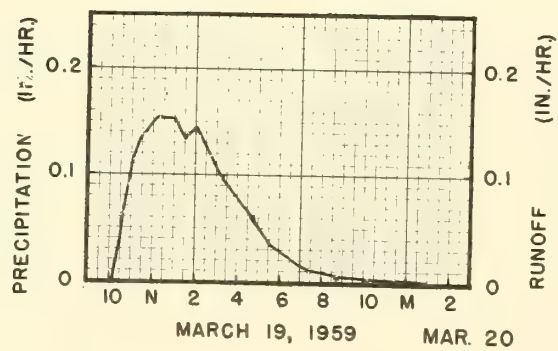
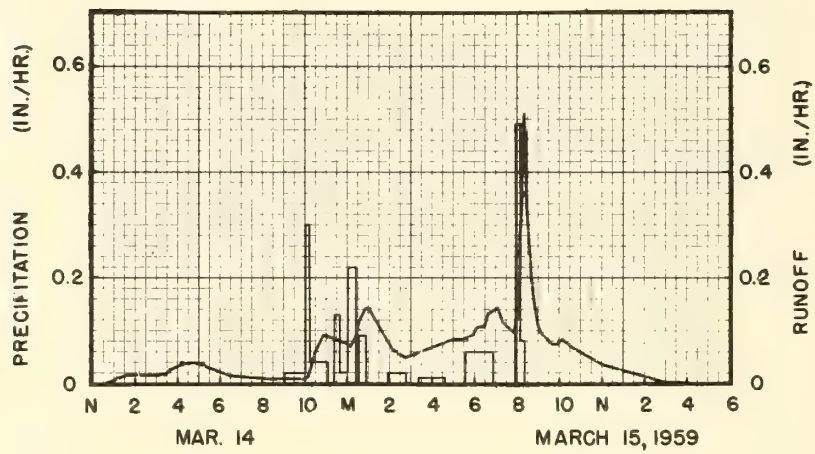
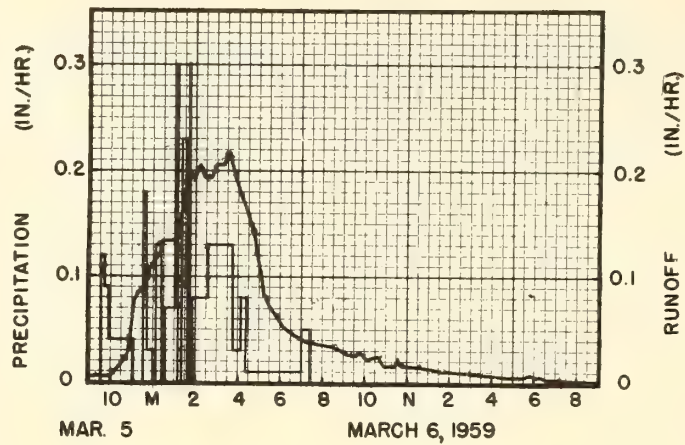
MONTHLY PRECIPITATION AND RUNOFF (Inches)								East Lansing, Michigan Watershed B (Area - 1.35 acres)								
Month Year		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	0.48	1.92	2.41	3.99	6.26	2.80	2.54	5.20	0.63	0.26	1.51	1.26	29.26		
	Q	0	.94	2.97	0	0	0	0	0	0	0	0	0	3.91		
1957	P	1.31	1.10	1.81	3.86	6.12	2.42	7.22	1.55	1.28	3.84	2.43	2.86	35.80		
	Q	0	.24	.03	0	0	0	.61	0	0	0	0	0	.88		
1958	P	1.57	.78	0.27	1.56	1.34	2.32	4.31	3.24	2.54	1.85	1.35	0.32	21.45		
	Q	0	.18	0	0	0	0	.01	0	0	0	0	0	.19		
1959	P	2.32	1.98	1.95	4.10	2.99	1.60	5.67	5.13	3.31	5.24	2.79	1.92	39.00		
	Q	.35	1.67	3.93	.01	0	0	0	0	0	0	0	0	5.96		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								East Lansing, Michigan Watershed B								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	7-11	2.37	7-11	0.28	7-11	0.37	7-11	0.45	7-11	0.45	7-11	0.45	7-11	0.45	7-8	0.61
1958	2-25	.03	2-25	.02	2-25	.03	2-25	.05	2-24	.09	2-24	.18	2-24	.18	2-24	.18
1959	3-15	.51	3-15	.25	3-6	.40	3-5	.93	3-14	1.22	3-14	1.51	3-14	1.63	2-27	3.37
Notes: Quality of records: excellent. Watershed conditions: 1957 - corn, 1958 - oats and 1959 - Alfalfa-Brome hay. Corrections: Q - 1950, February 1.24, March 2.07. Q - 1951, February 1.43, Total 1.52.																
SELECTED RUNOFF EVENTS								East Lansing, Michigan Watershed B								
Antecedent conditions			Rainfall				Runoff									
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of March 5, 1959																
2-5-59	0.04 s	0	3-5-59	Raingage	Cult.	3-5-59										
2-9	.30 rs	0	9:32p	0	0	2:44p	0	0								
2-10	.47 rs	.19	:42	.12	.02	:54	.0033	.0003								
2-11	.08 rs	.16	:56	.09	.04	3:26	.0054	.0027								
2-12	.09	0	11:04	.04	.09	5:50	.0105	.0218								
2-13	.02	.26	:32	0	.09	6:30	.0077	.0279								
2-14	.28	.33	:42	.18	.12	8:20	.0054	.0399								
2-15	T rs	.13	12:00	.03	.13	9:50	.0054	.0480								
2-18	.10	0	3-6-59			10:08	.0077	.0499								
2-21	T s	0	:10a	0	.13	:41	.0212	.0574								
2-23	.34 rs	.15	:24	.13	.16	:48	.0299	.0603								
2-24	0	.11	:36	0	.16	11:07	.0759	.0774								
2-25	0	.01	1:02	.07	.19	:16	.0830	.0893								
2-26	.06 rs	.03	:12	.30	.24	:36	.0904	.1182								
2-27	T	.10	:18	0	.24	:43	.0984	.1293								
2-28	0	.21	:26	.23	.27	:47	.1065	.1361								
3-1	0	.45	:36	0	.27	3-6-59										
3-2	T	.57	:38	.30	.28	12:20a	.1234	.1997								
3-3	.02 s	.46	:44	0	.28	:26	.1330	.2125								
3-4	0	.22	2:36	.08	.35	1:08	.1330	.3056								
3-5	0	.02	3:46	.13	.50	:20	.1616	.3351								
			4:08	.03	.51	:36	.1939	.3825								
			:24	.08	.53	:58	.1939	.4535								
			7:00	.01	.55	2:13	.2057	.5035								
			:24	.05	.57	:24	.1939	.5401								
						:45	.1939	.6080								
						:54	.2057	.6380								
						3:20	.2057	.7271								
						:28	.2174	.7553								
						:36	.2174	.7844								
Notes: To convert runoff in in/hr to cfs, multiply by 1.36. On March 3, 1959 there was about 3 inches of water stored on the surface of the watershed in the form of ice and snow. For map of watershed, see page 23.1-6.																

SELECTED RUNOFF EVENTS					East Lansing, Michigan		Watershed B	
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			Event of March 5, 1959 - Continued					
						3:50a	0.1939	0.8323
						1:26	.1125	.9329
						5:13	.0830	1.0198
						:22	.0759	1.0317
						6:02	.0563	1.0757
						:37	.0118	1.1052
						7:11	.0395	1.1312
						8:22	.0316	1.1732
						:30	.0316	1.1778
						9:20	.0255	1.2029
						:36	.0255	1.2097
						:15	.0299	1.2138
						10:01	.0212	1.2219
						:32	.0255	1.2328
						:50	.0172	1.2389
						11:20	.0172	1.2475
						:32	.0212	1.2511
						:40	.0172	1.2539
						12:35p	.0137	1.2681
						1:10	.0105	1.2812
						1:11	.0051	1.3077
						5:21	.0051	1.3092
						:12	.0077	1.3112
						:11	.0051	1.3117
						:31	.0033	1.3161
						8:30	.0015	1.3207
						10:56	.0015	1.3211
						11:01	.0033	1.3247
						:27	.0051	1.3261
						11:0	.0033	1.3270
						12:00	.0033	1.3281
						3-7-59		
						12:16a	.0051	1.3315
						:55	.0077	1.3325
						1:16	.0172	1.3358
						:20	.0212	1.3387
						:31	.0172	1.3426
						:50	.0172	1.3477
						:	.0137	1.3493
						2:02	.0105	1.3501
						:18	0	1.3513
Notes: To convert runoff in in/hr to cfs, multiply by 1.36. On March 3, 1959 there was about 3 inches of water stored on the surface of the watershed in the form of snow and ice.								

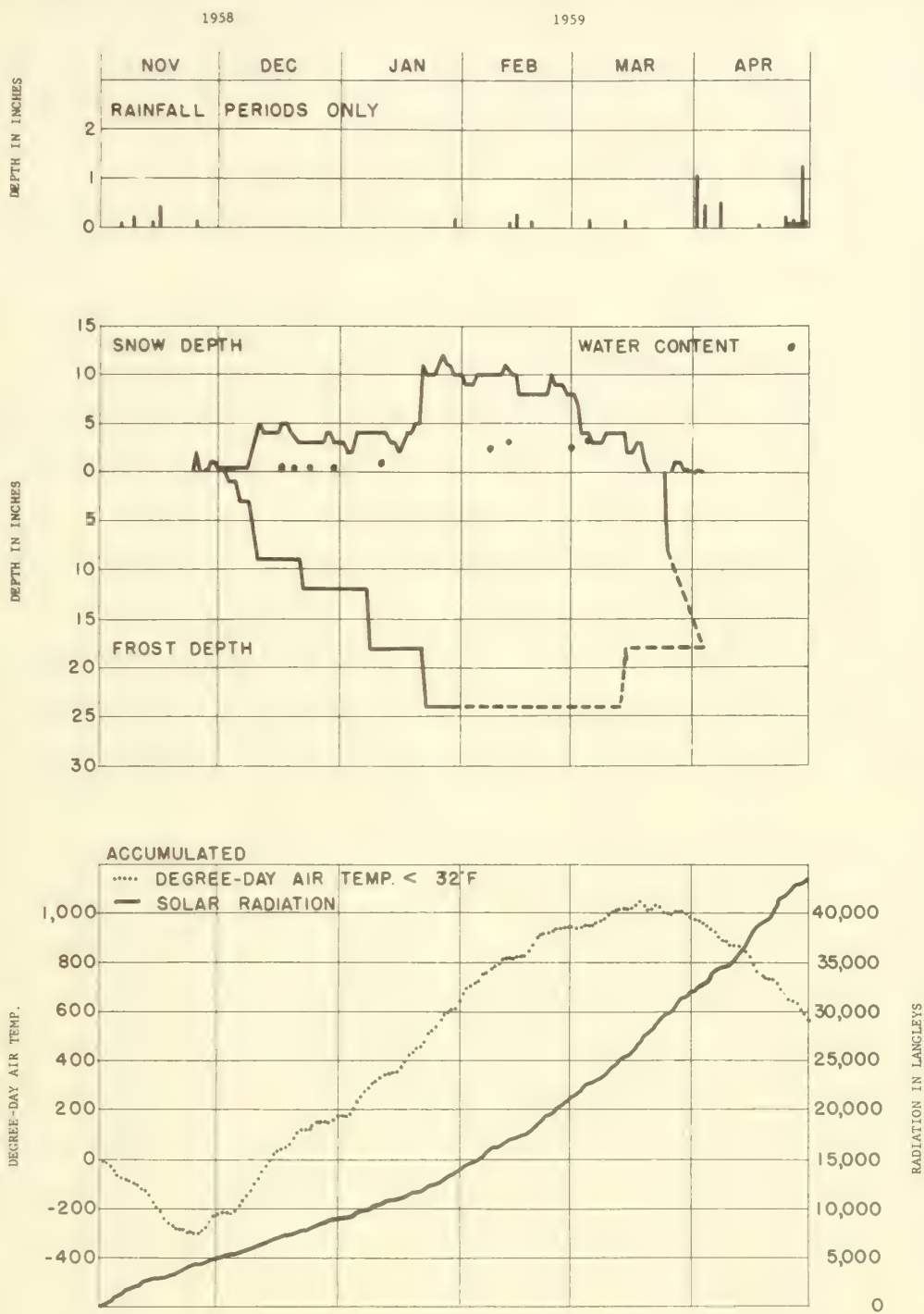
SELECTED RUNOFF EVENTS					East Lansing, Michigan Watershed B			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of March 14, 1959								
2-14-59	0.28	0.33	3-14-59	Raingage	Cult.	3-14-59		
2-15	T rs	.13	9:00p	0	0	12:34p	0	0
2-18	.10	0	10:00	.02	.02	:38	.0033	.0001
2-21	T s	0	:08	.30	.06	:58	.0054	.0016
2-23	.34 rs	.15	11:04	.04	.12	1:40	.0172	.0095
2-24	0	.11	:22	0	.12	3:20	.0172	.0382
2-25	0	.01	:36	.13	.15	:40	.0212	.0446
2-26	.06 rs	.03	12:00	.02	.16	4:10	.0346	.0585
2-27	T	.10	3-15-59			:36	.0395	.0746
2-28	0	.21	12:22	.22	.24	:54	.0395	.0864
3-1	0	.45	:30	0	.24	6:24	.0172	.1277
3-2	T	.57	:50	.09	.27	8:24	.0077	.1507
3-3	.02 s	.46	1:52	0	.27	9:54	.0077	.1622
3-4	0	.22	2:42	.02	.29	10:08	.0105	.1644
3-5	.16	.18	3:20	0	.29	:29	.0563	.1747
3-6	.45	1.17	4:34	.01	.30	:53	.0904	.2042
3-7	0	.02	5:32	0	.30	11:00	.0904	.2148
3-8	.07 s	.01	6:48	.06	.37	12:00	.0759	.2971
3-9	T s	0	7:56	0	.37	3-15-59		
3-12	T s	.04	8:12	.49	.50	:10 <sup>a</sup>	.0691	.3092
3-13	.02	.10	:20	.08	.51	:20	.0830	.3217
3-14	0	.01				:31	.1146	.3399
Watershed conditions: Alfalfa-Brome meadow. Surface soil frozen.						:50	.1425	.3811
						1:00	.1425	.4048
						2:08	.0625	.5146
						:43	.0504	.5475
						5:00	.0830	.6983
						:30	.0830	.7398
						:50	.0904	.7687
						6:06	.1065	.7949
						:27	.1065	.8322
						:39	.1330	.8561
						7:04	.1425	.9135
						:19	.1146	.9457
						:50	.0984	.9998
						8:00	.1234	1.0179
						:03	.1521	1.0247
						:10	.2424	1.0472
						:15	.3555	1.0713
						:21	.3120	1.1162
						:24	.4555	1.1408
						:29	.3401	1.1740
						:39	.2057	1.2190
						:50	.1425	1.2510
						:58	.1146	1.2682
						9:05	.0984	1.2806
						:38	.0759	1.3266
						:50	.0759	1.3417
						10:10	.0830	1.3682
						:34	.0691	1.3986
						12:00	.0395	1.4749
						3:00p	.0033	1.5361
						:40	.0015	1.5377
						4:40	.0015	1.5392
						:42	0	1.5392
Notes: To convert runoff in in/hr to cfs, multiply by 1.36. On March 3, 1959 there was about 3 inches of water stored on the surface of the watershed in the form of snow and ice.								



SELECTED RUNOFF EVENTS			East Lansing, Michigan Watershed B					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of March 19, 1959								
2-21-59	T s			Raingage	Cult.	3-19-59		
2-23	.34 rs	0.15				10:08a	0	0
2-24	0	.11				:16	.0172	.0014
2-25	0	.01				:26	.0346	.0057
2-26	.06 rs	.03				:40	.0625	.0170
2-27	T	.10				11:04	.1146	.0523
2-28	0	.21				:22	.1330	.0895
3-1	0	.45				12:10p	.1521	.2032
3-2	T	.57				1:00	.1521	.3299
3-3	.02 s	.46				:30	.1330	.4012
3-4	0	.22	No precipitation			2:00	.1425	.4701
3-5	.16	.18				3:18	.0984	.6246
3-6	.45	1.17				4:21	.0691	.7127
3-7	0	.02				5:32	.0346	.7731
3-8	.07 s	.01				7:00	.0137	.8074
3-9	T s	0				:20	.0105	.8114
3-12	T s	.14				8:40	.0054	.8220
3-13	.02	.10				10:30	.0033	.8300
3-14	.16	.31				12:00	.0015	.8336
3-15	.39 rs	1.24				3-20-59		
3-16	0	.10				12:50a	.0015	.8349
3-17	.09 s	0				:58	0	.8350
3-18	0	.16						
Watershed conditions: Alfalfa-Brome meadow. Surface soil frozen.								
Notes: To convert runoff in in/hr to cfs, multiply by 1.36. On March 3, 1959 there was about 3 inches of water stored on the surface of the watershed in the form of snow and ice.								



EAST LANSING, MICHIGAN WATERSHED B



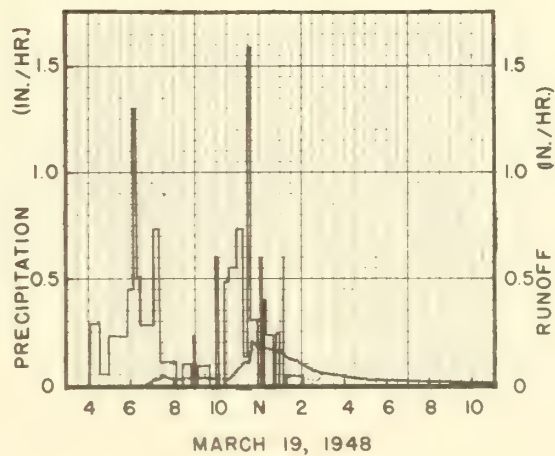
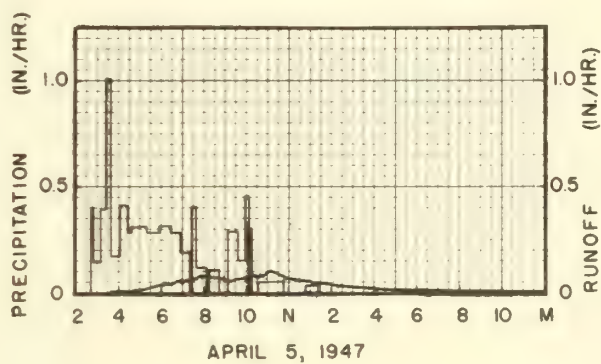
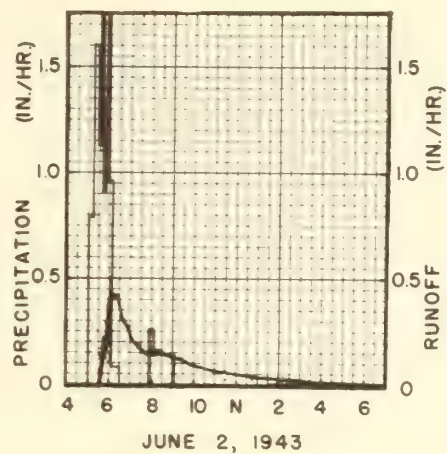
EAST LANSING, MICHIGAN WATERSHED B



MONTHLY PRECIPITATION AND RUNOFF (Inches)								East Lansing, Michigan Watershed W (Area - 1.65 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	0.76 0	2.43 0	1.82 0	4.23 .31	5.93 .46	2.97 0	3.23 0	4.88 0	0.89 0	0.36 0	1.37 0	1.56 0	30.43 .77			
1957 P Q	1.76 0	1.58 0	1.62 0	3.46 0	5.68 .92	3.61 0	7.14 .01	1.87 0	1.60 0	4.06 0	2.70 0	2.25 0	37.33 .93			
1958 P Q	0.94 0	0.49 0	0.59 0	1.68 0	1.05 0	2.15 0	3.95 0	3.40 0	2.89 0	2.34 0	1.79 0	0.50 0	21.77 0			
1959 P Q	2.93 0	2.18 .04	2.59 0	3.68 .12	2.77 0	0.65 0	4.33 0	6.00 0	2.30 0	5.02 T	3.10 0	2.47 0	38.02 .16			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								East Lansing, Michigan Watershed W								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	5-18	0.01	5-18	0.01	5-18	0.01	5-18	0.05	5-18	0.07	5-18	0.09	5-18	0.09	5-18	0.09
1958		-		-		-		-		-		-		-		-
1959	2-12	.01	4-1	.01	4-1	.02	4-1	.05	4-1	.08	4-1	.06	4-1	.12	4-1	.12
Notes: Quality of records: excellent. Watershed condition: oak-hickory woodlot.																
SELECTED RUNOFF EVENTS								East Lansing, Michigan Watershed W								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of June 2, 1943																
5-2-43	0.07	0	6-2-43	Raingage	Woods	6-2-43										
5-5	.30	0	5:00a	0	0	5:34a	0	0								
5-8	.81	0	:16	.78	.21	:41	.0740	.0026								
5-10	.18	0	:25	1.60	.45	:46½	.2197	.0146								
5-11	1.50	.30														
5-15	.12	0	5:33	1.13	.60	5:48	.1782	.0194								
5-16	.51	0	:41	3.30	1.04	:55	.3732	.0514								
5-17	.07	0	:47	.90	1.13	6:08	.4352	.1381								
5-18	.19	0	:56	3.12	1.60	:12	.4196	.1666								
5-19	.08	0	6:06	.96	1.76	:20	.4196	.2225								
5-20	.56	0	:30	.08	1.79	:30	.3732	.2892								
5-21	.16	0	7:51	0	1.79	:40	.3040	.3540								
5-23	.02	0	8:05	.26	1.85	:49	.2661	.3968								
5-24	1.02	T	9:01	.14	1.98	7:02	.2197	.4492								
5-25	.06	0				:21	.1782	.5120								
5-29	.21	0				:50	.1409	.5885								
5-30	.39	0				:58	.1499	.6079								
5-31	.27	0				8:08	.1409	.6321								
6-1	.59	0				:16	.1589	.6523								
6-2	.15	0				:26	.1589	.6788								
						:32	.1499	.6942								
						9:34	.1090	.8282								
						:52	.0939	.8587								
						10:55	.0680	.9437								
						12:56	.0367	1.0469								
						3:50p	.0141	1.1201								
Notes: To convert runoff in in/hr to cfs, multiply by 1.66.																

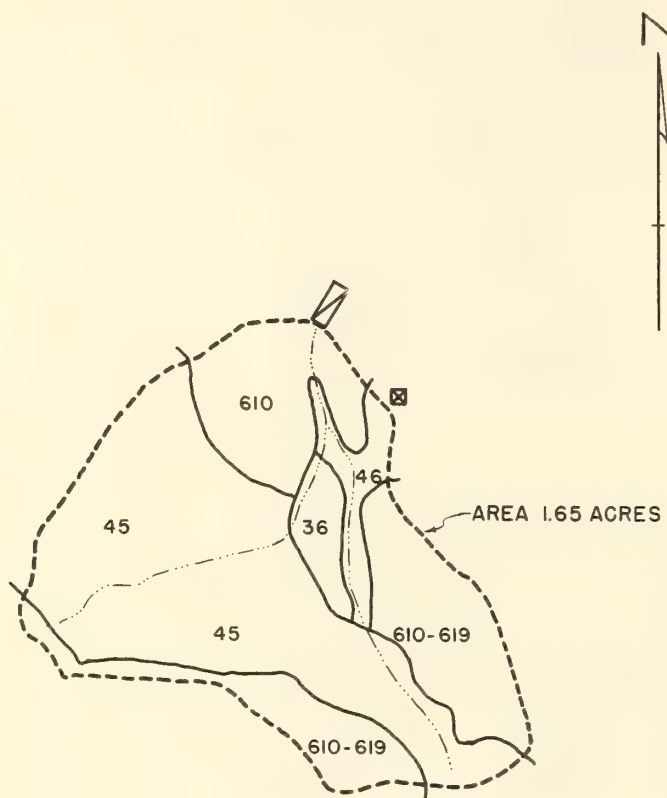
SELECTED RUNOFF EVENTS			East Lansing, Michigan Watershed W					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 2, 1943 - Continued								
Watershed conditions: Oak-hickory woodlot. Rains accompanied a local tornado which passed within 1/2 mile of watershed.						5:52p	0.0086	1.1435
						7:01	.0063	1.1521
						8:18	.0044	1.1590
						10:05	.0027	1.1654
						6-3-43		
						1:44a	0	1.1698
Event of April 5, 1947								
3-13-47	0.24	0	4-5-47	Raingage	Woods	4-5-47		
3-14	T	0	2-43a	0	(	3:40a	0	0
3-15	.01 s	0	:49	.40	.04	4:02	.0027	.0002
3-16	.01	0	3:11	.14	.09	:16	.0086	.0015
3-17	T	0	:25	.39	.18	:19	.0086	.0019
3-21	.02 s	0	:41	1.01	.45	:39	.0141	.0057
3-23	.25	0	4:02	.17	.51	:57	.0173	.0104
			:24	.41	.66	5:07	.0209	.0136
			:39	.28	.73	:37	.0283	.0259
			5:22	.32	.96	6:05	.0367	.0410
			:54	.28	1.11	:35	.0460	.0616
			6:28	.32	1.29	:43	.0512	.0681
			:52	.28	1.40	:54	.0512	.0775
			7:21	.19	1.49	7:16	.0565	.0972
			:23	0	1.49	:34	.0621	.1150
			:41	.40	1.61	:41	.0621	.1222
			8:06	.12	1.66	:45	.0739	.1267
			:14	0	1.66	8:03	.0739	.1489
			:46	.11	1.72	:56	.0621	.2083
			9:12	0	1.72	9:08	.0565	.2202
			:36	.28	1.83	:14	.0565	.2259
			:56	.15	1.88	:26	.0621	.2378
			10:04	.45	1.94	:58	.0679	.2725
			:08	0	1.94	10:13	.0739	.2902
			:12	.30	1.96	:17	.0805	.2953
			:32	0	1.96	:27	.0739	.3082
			11:44	.10	2.08	:33	.0739	.3156
			12:44p	0	2.08	:37	.0872	.3210
			1:20	.07	2.12	:45	.0805	.3325
			:52	0	2.12	11:07	.1010	.3663
			2:56	.04	2.16	:56	.0679	.4331
						2:14p	.0367	.5519
						3:16	.0283	.5852
						4:02	.0245	.6054
						:32	.0209	.6168
						5:18	.0173	.6314
						6:00	.0173	.6435
						8:20	.0141	.6801
						10:44	.0086	.7068
						12:00	.0063	.7162
						4-6-47		
						2:20a	.0044	.7287
						3:50	.0027	.7340
						5:30	.0013	.7373
						9:09	0	.7397
Notes: To convert runoff in in/hr to cfs, multiply by 1.66.								

SELECTED RUNOFF EVENTS						East Lansing, Michigan Watershed W		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of March 19, 1948								
2-24-48	T	0	3-19-48	Raingage	Woods	3-19-48		
2-25	.02	0	4:05a	0	0	6:43a	0	0
2-27	.93	0	:32	.29	.13	:57	.0209	.0030
2-28	.49	0	:58	.05	.15	7:10	.0245	.0079
2-29	T	0	5:47	.23	.34	:20	.0245	.0120
3-1	.03	0	6:03	.45	.46	:21	.0367	.0125
3-2	.43	0	:15	1.30	.72	:30	.0412	.0183
3-6	.01	0	:22	.51	.78	:47	.0323	.0287
3-7	.02	0	7:02	.27	.96	:58	.0323	.0346
3-15	.02	0	:20	.73	1.18	8:10	.0283	.0407
3-16	.18	0	8:08	.11	1.27	:24	.0283	.0473
3-17	T	0	:24	0	1.27	9:06	.0323	.0685
			:48	.10	1.31	10:30	.0283	.1109
			:52	0	1.31	:47	.0460	.1214
			9:00	.23	1.34	:51	.0621	.1250
			:10	0	1.34	11:11	.0872	.1499
			:42	.09	1.39	:15	.1088	.1564
			:59	0	1.39	:21	.1166	.1677
			10:04	.60	1.44	:31	.1088	.1865
			:20	0	1.44	:37	.1984	.2019
			:35	.48	1.56	:40	.2086	.2121
			:58	.55	1.77	:55	.1779	.2604
			11:16	.73	1.99	12:54p	.1587	.4268
			:25	.13	2.01	1:24	.1244	.4976
			:36	1.58	2.30	:32	.1244	.5142
			:57	.31	2.41	2:30	.0739	.6100
			12:04p	0	2.41	:52	.0679	.6300
			:06	.60	2.43	3:51	.0412	.6896
			:10	0	2.43	5:10	.0245	.7239
			:19	.40	2.49	10:11	.0141	.7911
			:42	.23	2.58	12:00m	.0086	.8344
			:46	0	2.58	3-20-48		
			:56	.24	2.62	9:00a	.0013	.8790
			1:11	0	2.62	1:40p	0	.8842
			:12	.60	2.63			
			:17	0	2.63			
			2:04	.04	2.66			
Notes: To convert runoff in in/hr to cfs, multiply by 1.66.								



EAST LANSING, MICHIGAN WATERSHED W





0 50 100  
SCALE IN FEET

AVERAGE SLOPE OF WATERSHED - 6.1%  
AVERAGE SLOPE OF THE WATERWAY - 3.1%

#### SOIL LEGEND

- 36 CONOVER SILT LOAM 1/  
45 MIAMI LOAM 2/  
46 CONOVER LOAM 1/  
610 HILLSDALE SANDY LOAM 2/  
610-619 HILLSDALE - SPINKS SANDY  
LOAM COMPLEX 2/

1/ INTERNAL SOIL DRAINAGE - SLOW

2/ INTERNAL SOIL DRAINAGE - MEDIUM

#### LEGEND

- RECORDING RAINGAGE (WOODS)  
☒ HYGROTHERMOGRAPH  
☒ SOIL THERMOGRAPH  
▨ RUNOFF AND EROSION  
MEASURING STATION

EAST LANSING, MICHIGAN  
WATERSHED W

MONTHLY PRECIPITATION AND RUNOFF (Inches)										McCredie, Missouri Station Reservoir Watershed W-1 (Area - 153 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	0.38 0	1.17 .02	0.39 0	2.57 .03	4.37 .02	1.80 0	9.18 1.31	2.78 T	0.65 0	1.22 0	1.60 .02	2.84 .06	28.95 1.46			
1957 P Q	1.33 0	2.13 .33	2.68 .68	5.48 2.08	4.45 .16	6.48 1.69	2.61 0	.38 0	1.29 0	2.82 0	1.96 0	2.82 0	34.43 4.94			
1958 P Q	1.25 .03	1.08 .24	3.01 1.20	2.69 .13	3.32 .30	5.31 .52	9.16 2.62	2.77 .38	3.10 0	2.08 .06	3.05 .21	.39 0	37.21 5.69			
1959 P Q	1.57 .51	2.72 1.76	2.32 .59	2.48 .22	5.39 .29	.07 0	3.15 0	2.21 0	4.65 .08	6.04 1.75	.58 0	1.99 .14	33.17 5.34			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							McCredie, Missouri Station Reservoir Watershed W-1									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957 <sup>1/</sup>	6-29	1.11	6-29	0.78	6-29	1.02	6-29	1.42	6-29	1.69	6-29	1.69	6-29	1.69	6-29	1.69
1958	7-19	.24	7-19	.21	7-19	.31	7-30	.54	7-19	.67	7-30	.76	7-30	1.12	7-15	1.33
1959	10-10	.39	10-10	.35	10-10	.59	10-10	.85	2-9	1.55	2-9	1.75	2-9	1.76	2-9	1.76
Notes: Quality of records: good. Watershed conditions: 55% - corn (36% on contour); 16% - pasture plots ( $\frac{1}{2}$ irrigated); 10% - corn, soybean plots (mostly up and down slope); 13% - unimproved pasture; 6% - miscellaneous roads, farmstead, and plots. <sup>1/</sup> Maximum discharge values for 1957 are revised and supersede those previously reported.																
SELECTED RUNOFF EVENTS							McCredie, Missouri Station Reservoir Watershed W-1									
Antecedent conditions				Rainfall					Runoff <sup>2/</sup>							
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of October 4-5, 1941																
9-4-41	0.32	0	10-4-41	Raingage	R-4	10-4-41										
9-8	.92	0	8:10a	0	0	8:10a	0.0205	0								
9-9	.78	.027	:18	1.42	.19	:30	.0720	.0176								
9-16	.80	.020	:27	1.07	.35	:40	.147	.0359								
9-24	1.88	.172	:44	.42	.47	:50	.261	.0700								
9-25	.14	.032	:55	.65	.59	9:00	.519	.1350								
9-28	.02	0	9:00	2.04	.76	:10	.910	.2540								
9-29	.49	0	:05	1.20	.86	:20	1.03	.4150								
9-30	.21	0	:10	3.72	1.17	:40	.949	.7440								
10-2	1.38	.342	:22	1.45	1.46	10:00	.852	1.0480								
10-3	.54	.027	:39	.28	1.54	:20	.852	1.3320								
10-4	.36 <sup>1/</sup>	.231 <sup>1/</sup>	:53	1.50	1.89	:40	.838	1.6158								
			10:05	1.20	2.13	:50	.812	1.7538								
			:15	.12	2.15	11:00	.680	1.8778								
			:22	.51	2.21	:20	.508	2.0738								
Watershed Conditions			:30	1.50	2.41	:40	.389	2.2248								
23% - corn, oats, soybean rotation;			:40	.24	2.45	12:00n	.317	2.3428								
3% - soybean, wheat, meadow rotation;			:48	1.80	2.69	:20p	.277	2.4418								
12% - pasture plots; 56% - unimproved pasture; 6% - miscellaneous roads, farmstead, & plots.			:51	.80	2.73	:40	.244	2.5278								
			:57	.10	2.74	1:00	.218	2.6048								
			11:16	.38	2.86	:20	.205	2.6758								
			:44	.28	2.99	:40	.238	2.7498								
			:59	.44	3.10	:50	.284	2.7938								
			12:32p	.45	3.25	2:00	.324	2.8448								
			1:12	.10	3.32	:10	.310	2.8978								
			:29	.32	3.41	:30	.224	2.9868								
			:35	1.00	3.51	3:00	.132	3.0738								
			:50	.20	3.56	:10	.125	3.0958								
			:55	1.08	3.65	:30	.317	3.1668								
			3:12	.04	3.70	:50	.554	3.3098								
Notes: To convert runoff in in/hr to cfs, multiply by 154,274. <sup>1/</sup> Prior to event beginning 8:10a.																
<sup>2/</sup> Runoff corrected for pondage above control and for rainfall falling directly on the reservoir surface.																
For methods, see Field Manual for Research in Agricultural Hydrology, U. S. Dept. Agr., Agr. Handb. No. 224, pp. 159-167, issued June 1962.																

Cooperative Research Project of USDA and the Missouri Agricultural Experiment Station

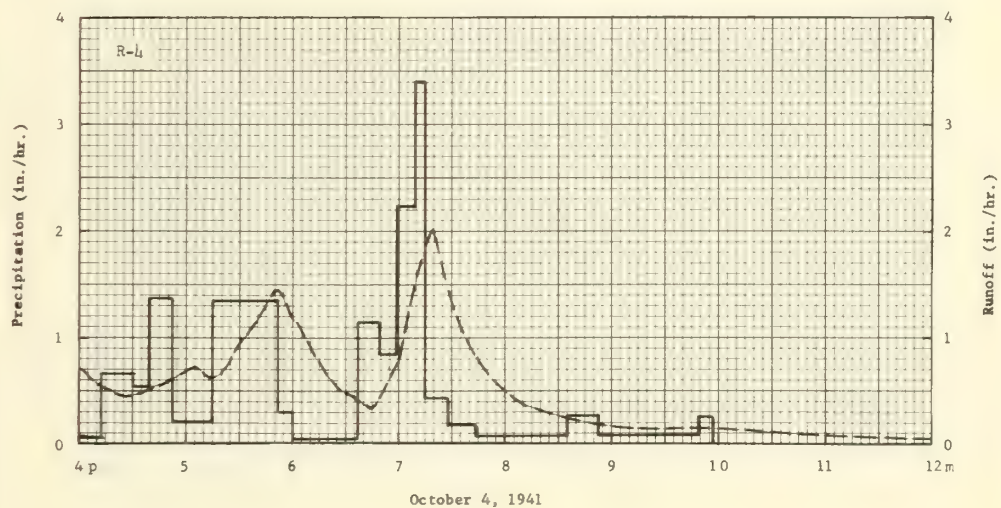
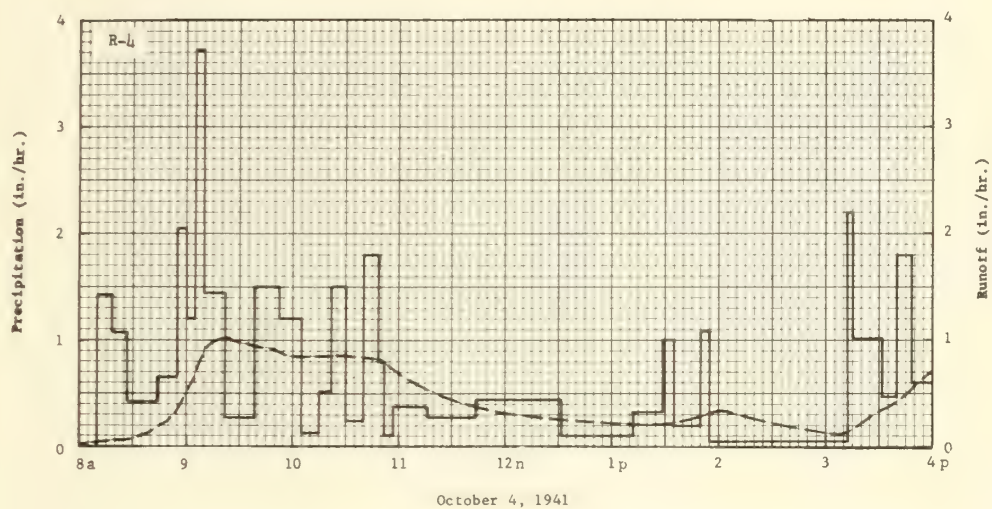
SELECTED RUNOFF EVENTS						McCredie, Missouri Station Reservoir Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of October 4-5, 1941 - Continued</u>								
			3:15p	2.20	3.81	4:00p	0.706	3.4158
			:31	1.01	4.08	:10	.574	3.5218
			:40	.47	4.15	:20	.486	3.6098
			:48	1.80	4.39	:25	.455	3.6488
			:59	.60	4.50	:30	.462	3.6868
			4:12	.05	4.51	:40	.528	3.7698
			:31	.66	4.72	:50	.587	3.8618
			:39	.53	4.79	5:00	.680	3.9678
			:52	1.38	5.09	:05	.720	4.0258
			5:15	.21	5.17	:15	.633	4.1378
			:52	1.34	6.00	:20	.653	4.1918
			6:00	.30	6.04	:30	.950	4.3248
			:37	.05	6.07	:40	1.14	4.4988
			:49	1.15	6.30	:50	1.44	4.7158
			:59	.84	6.44	:55	1.39	4.8338
			7:09	2.22	6.81	6:00	1.19	4.9408
			:15	3.40	7.15	:15	.757	5.1838
			:28	.42	7.24	:30	.488	5.3338
			:44	.19	7.29	:45	.336	5.4368
			8:35	.09	7.37	:50	.462	5.4698
			:46	.22	7.41	7:00	.757	5.5718
			9:49	.09	7.50	:10	1.54	5.7668
			:56	.26	7.53	:20	2.01	6.0668
						:25	1.60	6.2168
						:30	1.35	6.3428
				R-2	7.50	:40	.958	6.5298
				R-3	7.33	:50	.663	6.6648
				R-5	7.40	8:00	.444	6.7568
						:30	.275	6.9338
				Average	7.46	9:00	.168	7.0428
						11:00	.0818	7.2926
						12:00m	e .0500	7.3585
						10-5-41		
						1:00a 1/	e .0220	7.3945
<u>Event of June 26, 1942</u>								
5-26-42	0.77	0.034	6-26-42	Raingage	R-4	6-26-42		
6-7	1.60	.136	1:41a	0	0	1:50a	0	0
6-9	.37	0	:45	1.65	.11	2:00	.0315	.0026
6-10	1.74	.878	:49	1.65	.22	:05	.0787	.0072
6-11	.19	0	:55	.20	.24	:10	.102	.0147
6-13	.56	.180	:59	0	.24	:15	.0722	.0220
6-15	.05	0	2:03	.90	.30	:20	.0429	.0268
6-18	1.27	.646	:11	.15	.32	:25	.114	.0333
6-19	.09	0	:21	.72	.44	:35	.417	.0767
6-20	.06	0	:28	1.89	.66	:45	.662	.1659
6-21	.18	0	:32	1.95	.79	:55	.941	.3007
6-22	.06	0	:39	1.03	.91	3:00	.944	.3795
6-25	1.40	.621	:43	1.50	1.01	:05	.883	.4556
			:48	.72	1.07	:10	.868	.5286
			:53	.36	1.10	:20	.589	.6544
<u>Watershed Conditions</u>			3:00	.09	1.11	:30	.425	.7377
			:05	.36	1.14	:40	.286	.7965
			:47	.01	1.15	:50	.174	.8344
			:49	.90	1.18	:55	.152	.8480
			:53	1.95	1.31	4:00	.247	.8648
			:56	.80	1.35	:10	.409	.9181
			4:01	2.04	1.52	:20	.557	.9986
			:05	.15	1.53	:30	.624	1.0970
			:15	1.02	1.70	:40	.673	1.2051
			:18	0	1.70	:50	.714	1.3207
Notes: To convert runoff in in/hr to cfs, multiply by 154.274. 1/ Runoff continued at rate less than 0.02 inches per hour until next event 10-9-41.								

SELECTED RUNOFF EVENTS			McCredie, Missouri/ Station Reservoir Watershed W-1					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 26, 1942 - Continued								
			4:30a	0.75	1.85	5:00a	0.7400	1.4418
			:35	1.08	1.94	:10	.575	1.5513
			:40	.72	2.00	:20	.494	1.6403
			:48	.90	2.12	:30	.381	1.7132
			:55	.26	2.15	:40	.303	1.7702
			5:30	.12	2.22	:50	.225	1.8142
			7:00	.05	2.30	6:00	.178	1.8444
						:20	.132	1.8960
						:40	.0997	1.9346
				Std-1	2.00	7:00	.0713	1.9631
				R-2	2.05	8:00	.0534	2.0243
				R-3	2.30	9:00	.0337	2.0703
				R-5	2.33	10:00	e .0277 $\frac{1}{e}$	2.1006
				Average	2.17	11:00	e .0086	2.1180
Event of June 7, 1945								
5-6-45	0.06	0	6-7-45	Raingage	R-4	6-7-45		
5-7	.37	0	2:54a	0	0	2:55a	0	0
5-9	.04	0	3:00	2.30	.23	3:00	.117	.0049
5-14	1.18	.138	:05	2.52	.44	:10	.171	.0289
5-15	.68	.800	:10	2.04	.61	:20	.329	.0705
5-16	.98	.701	:15	1.68	.75	:30	.410	.1321
5-17	.22	.178	:20	.84	.82	:40	.372	.1973
5-24	.13	0	:30	.06	.83	:50	.314	.2544
5-25	.34	0	:40	.42	.90	4:00	.290	.3045
5-27	.16	0	:48	.15	.92	:10	.353	.3583
5-28	.53	.016	:53	1.20	1.02	:20	.410	.4218
5-29	.03	0	4:05	.55	1.13	:30	.393	.4887
6-1	.17	0	:16	1.04	1.32	:40	.347	.5503
6-5	.43	0	:30	.17	1.36	:50	.290	.6033
6-6	.02	0	5:25	.02	1.38	5:00	.237	.6472
Watershed Conditions  23% corn, oats, soybean rotation; 3% - soybean, wheat, meadow rota- tion; 12% - pasture plots; 56% - unimproved pasture; 6% - miscel- laneous roads, farmstead, & plots.			:57	.26	1.52	:20	.112	.7040
			6:12	.72	1.70	:40	.0489	.7300
			:22	.30	1.75	6:00	.0759	.7461
			:32	.78	1.88	:10	.115	.7623
			:35	1.60	1.96	:20	.211	.7904
			:42	.34	2.00	:30	.292	.8319
			:46	4.50	2.30	:40	.393	.8876
			:54	1.50	2.50	:45	.472	.9236
			7:05	.20	2.54	:50	.718	.9732
			:12	.69	2.62	:55	.998	1.0446
			:25	.54	2.71	7:00	1.18	1.1353
			:35	.36	2.77	:05	1.17	1.2331
			:55	.36	2.89	:10	.933	1.3205
			8:05	.09	2.92	:15	.802	1.3927
			:30	.12	2.97	:20	.692	1.4549
			:45	.04	2.98	:30	.628	1.5653
						:40	.547	1.6631
				Std-1	3.13	8:00	.424	1.8250
				R-2	3.06	:20	.326	1.9481
						:40	.207	2.0354
				R-3	3.00	9:00	.136	2.0913
				R-5	2.94	:20	.0802	2.1273
				R-6	2.89	:40	.0528	2.1495
				Average	3.00	10:00	.0489	2.1664
						11:00	.0241	2.2009
						12:00n	.0046	2.2152
						:30	0	2.2164

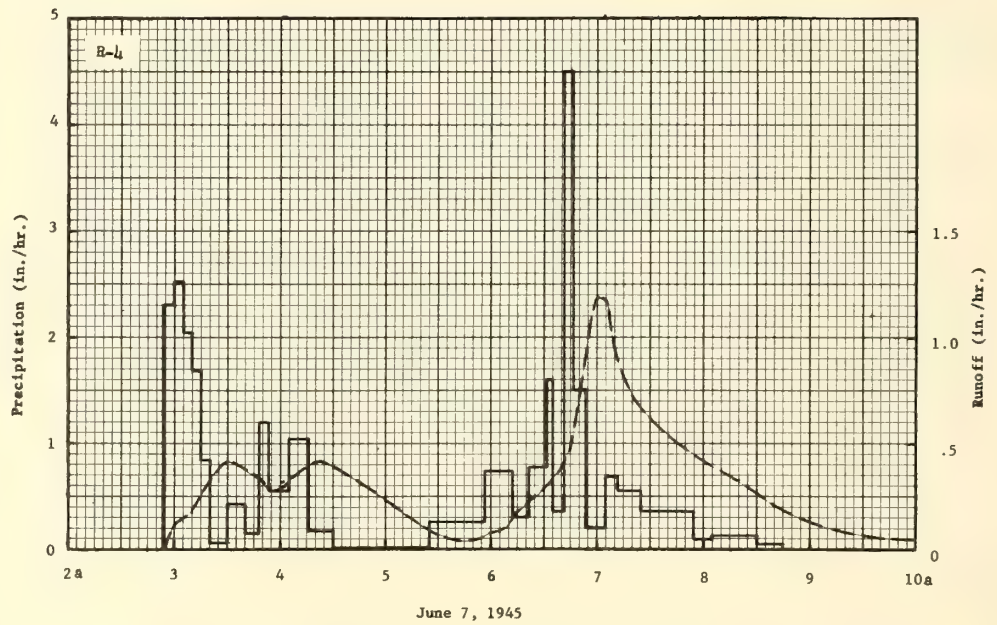
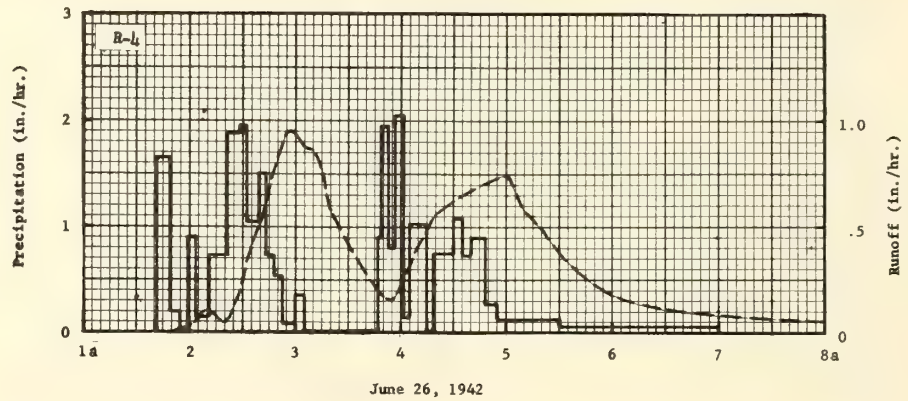
Notes: To convert runoff in in/hr to cfs, multiply by 154.274.  $\frac{1}{e}$  New storm began, estimated from later recession.



SELECTED RUNOFF EVENTS						McCredie, Missouri Station Reservoir Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 19, 1949</u>								
7-20-49	0.23	0	8-19-49	Raingage	R-4	8-19-49		
7-29	.78	0	2:17p	0	0	2:17p	0	0
8-10	.08	0	:23	5.00	.50	:25	.170	.0122
8-12	.37	0	:29	5.00	1.00	:35	.322	.0530
8-14	.16	0	:35	5.40	1.54	:45	.232	.0981
8-19	.35 <u>1/</u>	0	:41	4.60	2.00	:50	.268	.1189
			:46	4.80	2.40	3:00	.359	.1709
			:53	2.40	2.68	:10	.344	.2295
			3:04	.55	2.78	:30	.290	.3353
			:45	.03	2.80	4:00	.173	.4519
<u>Watershed Conditions</u>			4:10	.12	2.85	:30	.0884	.5157
23% - corn, oats, soybean rotation;			5:00	.04	2.88	5:00	.0497	.5495
20% - corn, soybean, wheat, meadow						6:00	.0177	.5811
rotation; 16% - pasture plots; 35%				Std-1	2.97	7:00	.0101	.5931
- unimproved pasture; 6% - miscel-				R-2	3.17	8:30	.0012	.6012
laneous roads, farmstead, & plots.				R-3	2.89			
				R-5	2.86	9:00	e 0 <u>2/</u>	.6015
				R-6	3.02			
				Average	2.96			
<u>Event of September 21-22, 1951</u>								
8-24-51	0.05	0	9-21-51	Raingage	R-4	9-21-51		
8-26	.33	0	7:05p	0	0	7:42p	0	0
8-27	.27	0	:10	3.72	.32	:48	.0278	.0023
8-28	.34	0	:15	3.00	.57	8:00	.0714	.0132
9-1	.02	0	:18	.60	.60	:06	.101	.0218
9-2	.04	0	:40	0	.60	:18	.0714	.0393
9-3	.16	0	:47	.86	.70	:24	.0657	.0462
9-4	.78	0	:55	1.72	.95	:42	.0842	.0687
9-9	1.47	.087	8:00	.48	1.03	:54	.144	.0890
9-12	.91	.157	:15	.12	1.06	9:00	.132	.1029
9-15	.04	0	:44	0	1.06	:06	.174	.1182
			:50	2.90	1.35	:12	.150	.1344
			:58	.22	1.38	:18	.145	.1492
			9:37	.02	1.39	:24	.164	.1647
			:45	.97	1.52	:30	.182	.1822
<u>Watershed Conditions</u>			10:20	.01	1.53	:36	.183	.2005
23% - corn, oats, soybean rotation;			:25	2.28	1.72	:48	.147	.2322
20% - corn, soybean, wheat, meadow			:35	.24	1.76	10:00	.129	.2596
rotation; 16% - pasture plots; 35%						:12	.148	.2880
- unimproved pasture; 6% - miscel-				Std-1	1.95	:18	.160	.3030
laneous roads, farmstead, & plots.				R-2	2.00	:24	.155	.3188
						:30	.149	.3340
				Average	1.90	:40	.155	.3593
						:50	.150	.3846
						11:00	.144	.4091
						:30	.100	.4693
						12:00m	.0754	.5133
						9-22-51		
						12:30a	.0633	.5491
						1:00	.0507	.5776
						:30	.0255	.5967
						2:00	.0192	.6089
						3:00	.0128	.6180
						5:00	0	.6307
Notes: To convert runoff in in/hr to cfs, multiply by 154.274. <u>1/</u> Prior to event beginning 2:17p. <u>2/</u> New storm began, estimated from later recession.								

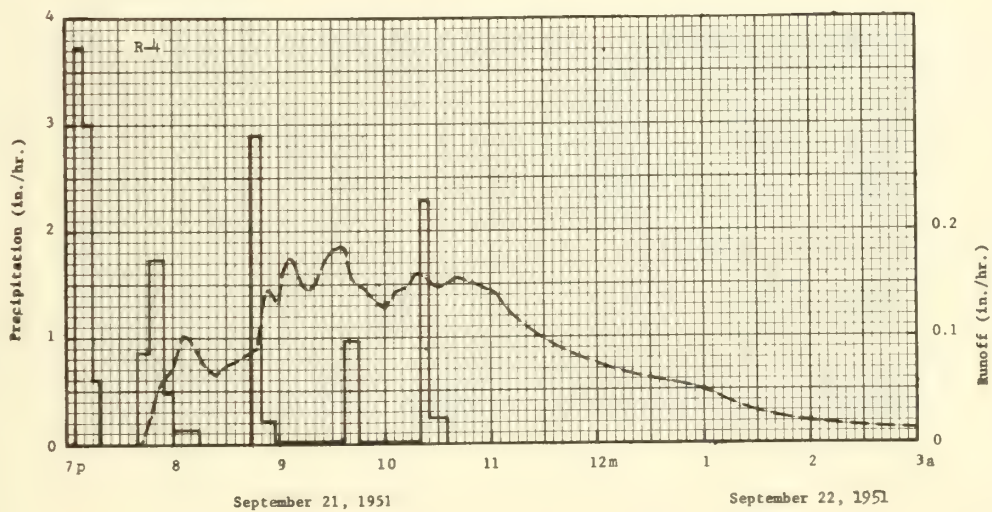
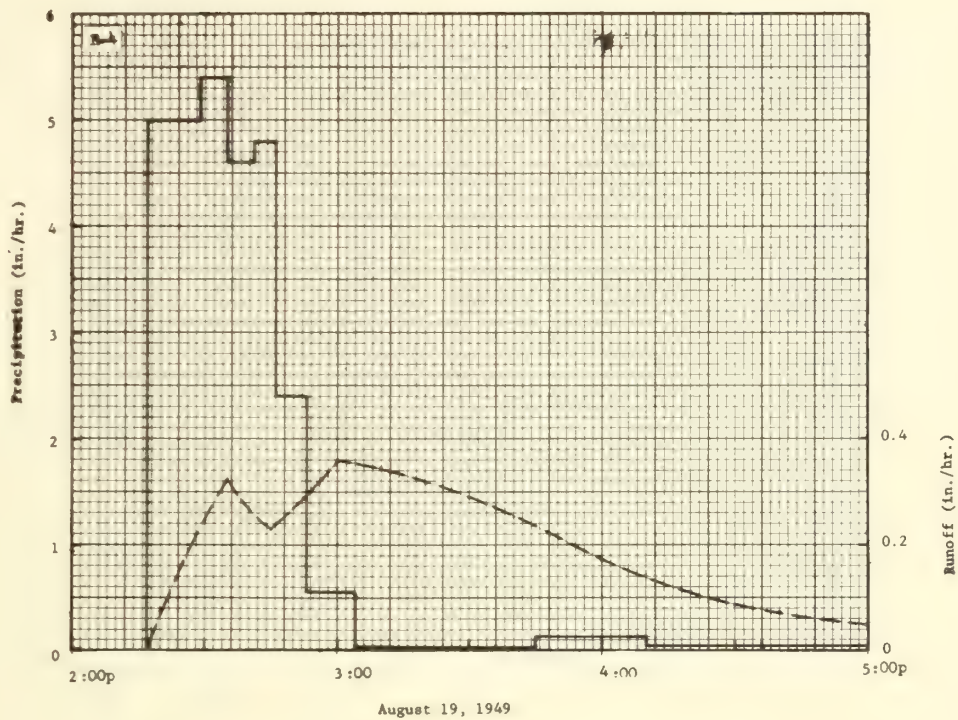


McCREDIE, MISSOURI STATION RESERVOIR WATERSHED W-1



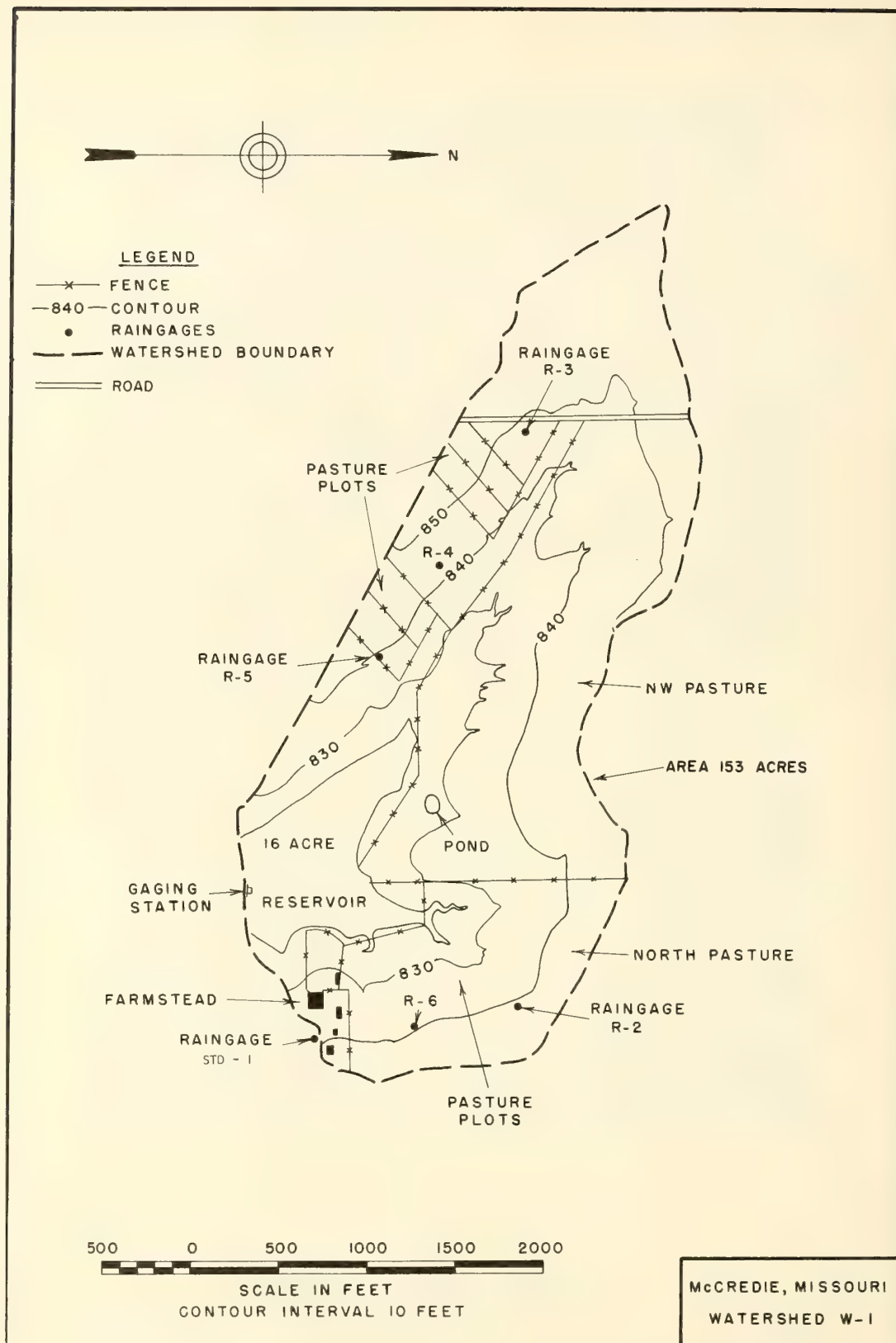
McCREDIE, MISSOURI STATION RESERVOIR WATERSHED W-1





McCREDIE, MISSOURI STATION RESERVOIR WATERSHED W-1

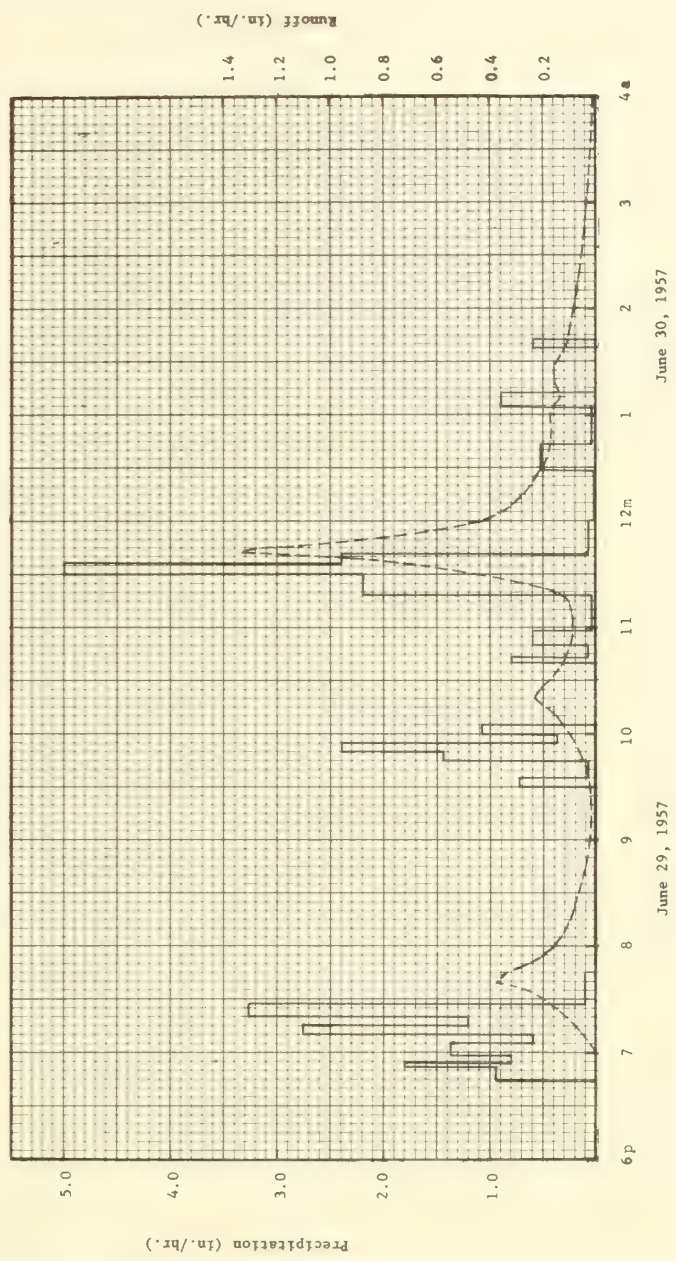




MONTHLY PRECIPITATION AND RUNOFF (Inches)								McCredie, Missouri S.W. Pond No. 2 Watershed (Area - 44.3 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	0.38	1.16	0.37	2.49	4.42	1.65	9.07	2.77	0.70	1.16	1.60	2.81	28.58		
	Q	0	.02	0	.02	.03	0	1.54	.01	0	T	.02	.02	1.66		
1957	P	1.33	2.13	2.74	5.56	4.27	6.31	2.66	.40	1.21	2.76	1.90	2.79	34.06		
	Q	0	.36	.33	1.98	.41	1.41	0	0	0	0	0	0	4.49		
1958	P	1.21	1.09	3.02	2.60	3.32	5.34	8.81	2.86	3.02	2.07	2.92	.38	36.64		
	Q	0	.20	1.46	.43	.25	.52	2.05	.33	0	.06	.33	0	5.63		
1959	P	1.53	2.72	2.18	2.45	5.21	.03	3.37	2.14	4.62	5.91	.57	1.91	32.64		
	Q	0	2.13	.65	.17	.43	0	0	0	.23	2.42	0	0	6.03		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								McCredie, Missouri S.W. Pond No. 2 Watershed								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957 <sup>1/</sup>	6-29	1.33	6-29	0.55	6-29	0.73	6-29	1.16	6-29	1.39	6-29	1.39	6-29	1.39	6-29	1.39
1958	7-19	.17	7-19	.16	7-19	.25	7-31	.42	7-31	.56	7-19	.64	7-30	.83	7-15	1.14
1959	10-10	.97	10-10	.48	10-10	.75	2-9	.91	2-9	1.75	2-9	2.09	2-9	2.12	10-4	2.20
Notes: Quality of records: P - excellent; Q - good. Watershed conditions: 23% in soybeans, soybeans, corn, wheat, wheat; 20% in soybeans, soybeans, corn, corn, corn; 34% in mixed grasses and weeds; 7% in row crops; 13% in pasture; 3% in weeds. <sup>1/</sup> Maximum discharge values for 1957 are corrected and supersede those previously reported.																
SELECTED RUNOFF EVENTS								McCredie, Missouri S.W. Pond No. 2 Watershed								
Antecedent conditions				Rainfall				Runoff <sup>2/</sup>								
Date	Rainfall (inches)		Runoff (inches)	Date and time	Intensity (in/hr)		Acc. (inches)	Date and time	Rate (in/hr)		Acc. (inches)					
Event of June 29-30, 1957																
5-30-57	0.12	0	6-29-57	Raingage	R-7		6-29-57									
6-1	.15	0	6:44p	0	0		7:00p	0								
6-4	.16	0	:51	.94	.11		:15	.0780	.009							
6-7	.75	.01	:54	1.80	.20		:30	.201	.044							
6-8	.36	.01	:58	.60	.24		:35	.260	.063							
6-10	.07	0	7:05	1.37	.40		:40	.370	.089							
6-12	.10	0	:10	.60	.45		:45	.334	.119							
6-14	.08	0	:15	2.75	.68		:50	.253	.144							
6-22	.10	0	:20	1.20	.78		8:00	.169	.178							
6-23	.05	0	:27	3.26	1.16		:10	.118	.202							
6-26	.32	0	:45	.10	1.19		:30	.0712	.232							
6-27	.03	0	9:30	0	1.19		9:00	.0260	.256							
6-28	.06	0	:35	.72	1.25		:30	.0177	.266							
6-29	.72 <sup>1/</sup>	0	:45	.06	1.26		:50	.0692	.278							
			:50	1.44	1.38		10:10	.145	.313							
Watershed Conditions:				:55	2.40		1.58	:15	.179		.327					
				10:00	.36		1.61	:20	.226		.344					
23% in 5 yr. rotation - 2 yr. soybeans, wheat, 2 yr. corn; 20% in 5 yr. rotation - 2 yr. soybeans, 3 yr. corn; 34% in grass & weeds; 13% in pasture; 7% in row crops; 3% in weeds.				:05	1.08		1.70	:25	.214		.362					
				:40	0		1.70	:40	.123		.405					
				:43	.80		1.74	:50	.0970		.423					
				:50	.08		1.75	11:00	.0852		.438					
				:58	.60		1.83	:10	.0970		.453					
				11:18	.03		1.84	:15	.105		.462					
				:30	2.20		2.28	:20	.160		.473					
				:36	5.00		2.78	:25	.275		.491					
				:41	2.40		2.98	:30	.446		.521					
				12:00p	.06		3.00	:36	.694		.576					
				6-30-57				:39	.930		.617					
				12:28a	.02		3.01	:42	1.328		.673					
				:43	.52		3.14	:45	1.205		.736					
Notes: To convert runoff in in/hr to cfs, multiply by 44.699. <sup>1/</sup> Prior to event beginning 6:44p.																
<sup>2/</sup> All flows corrected for pondage in pond above control. For method, see Field Manual for Research in Agricultural Hydrology, U. S. Dept. Agr., Agr. Handb. No. 224, June 1962, pp 159-163.																

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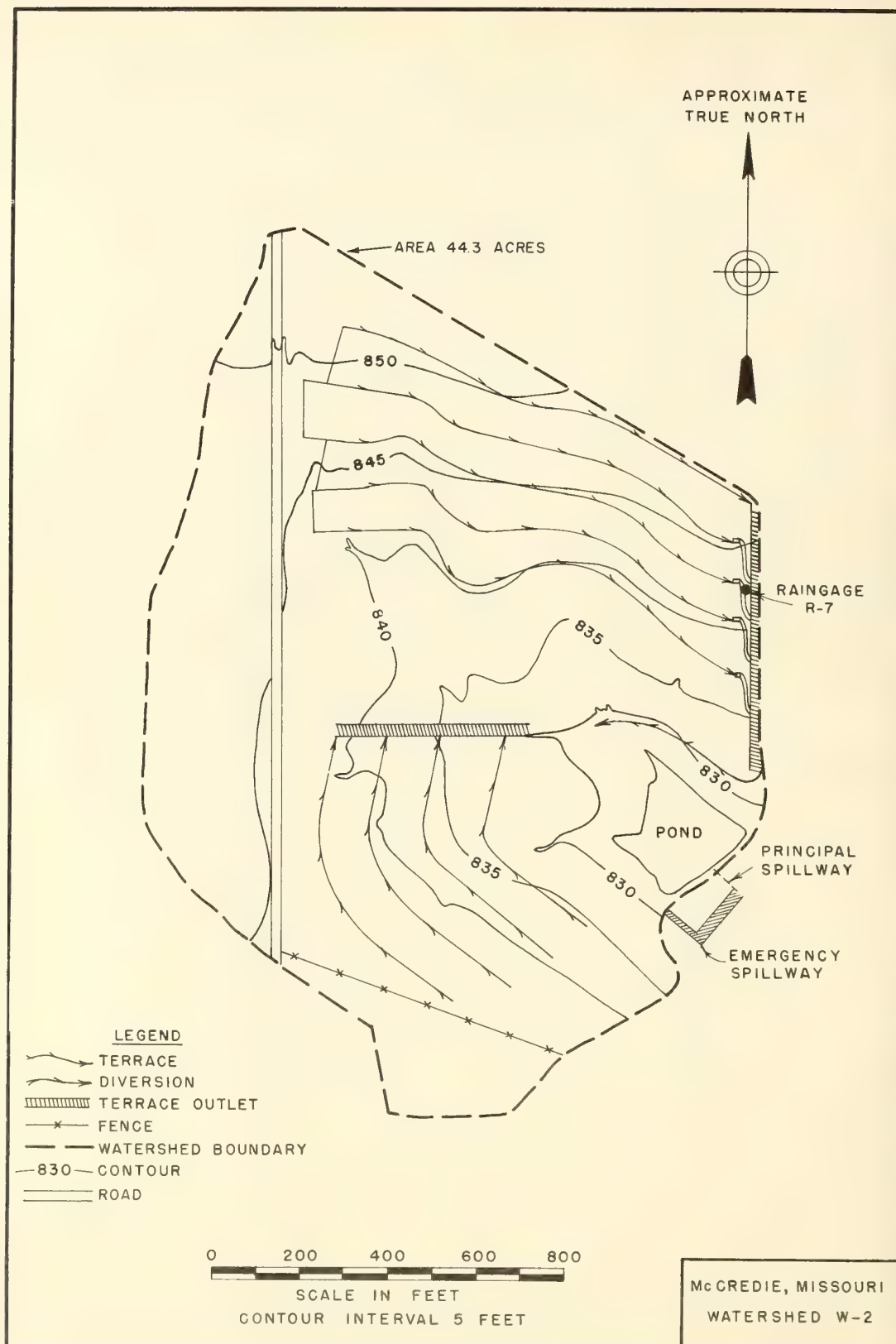
SELECTED RUNOFF EVENTS						McCredie, Missouri S.W. Pond No. 2 Watershed		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 29-30, 1957 - Continued								
			6-30-57			6-29-57		
			1:04a	0.03	3.15	11:51p	0.775	0.832
			:12	.90	3.27	:54	.618	.867
			:37	0	3.27	12:00m	.421	.918
			:42	.60	3.32	6-30-57		
						12:06a	.338	.955
						:12	.302	.988
						:25	.233	1.045
						:40	.179	1.097
						1:00	.172	1.156
						:10	.140	1.182
						:20	.156	1.206
						:30	.153	1.232
						:40	.134	1.256
						2:00	.0918	1.292
						:30	.0544	1.328
						3:00	.0410	1.353
						:30	.0204	1.366
						4:00	.0132	1.375
						5:00	0	1.387
Notes: To convert runoff in in/hr to cfs, multiply by 44.699.								



McCREDIE, MISSOURI

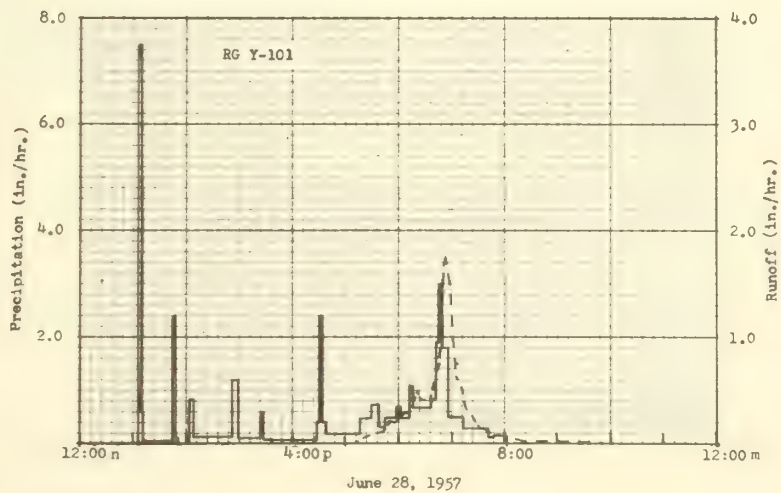
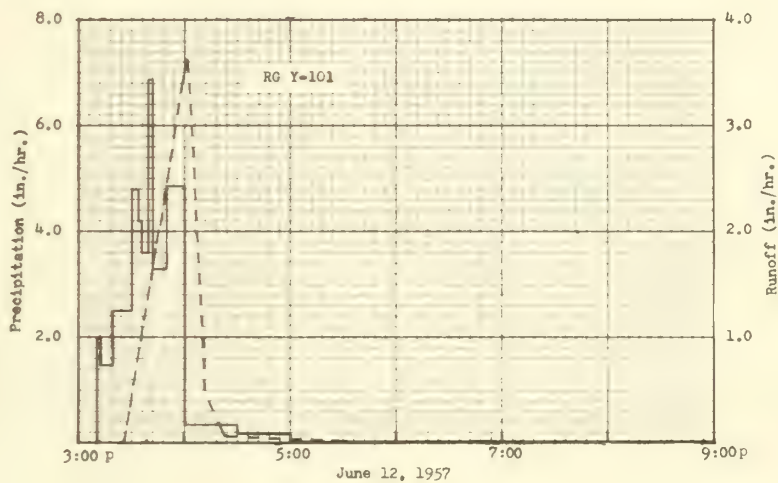
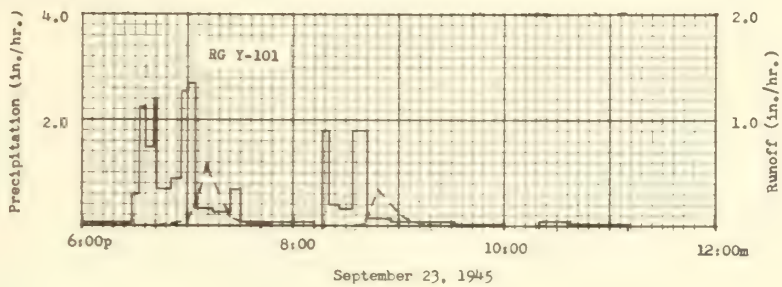
S.W. POND NO. 2 WATERSHED





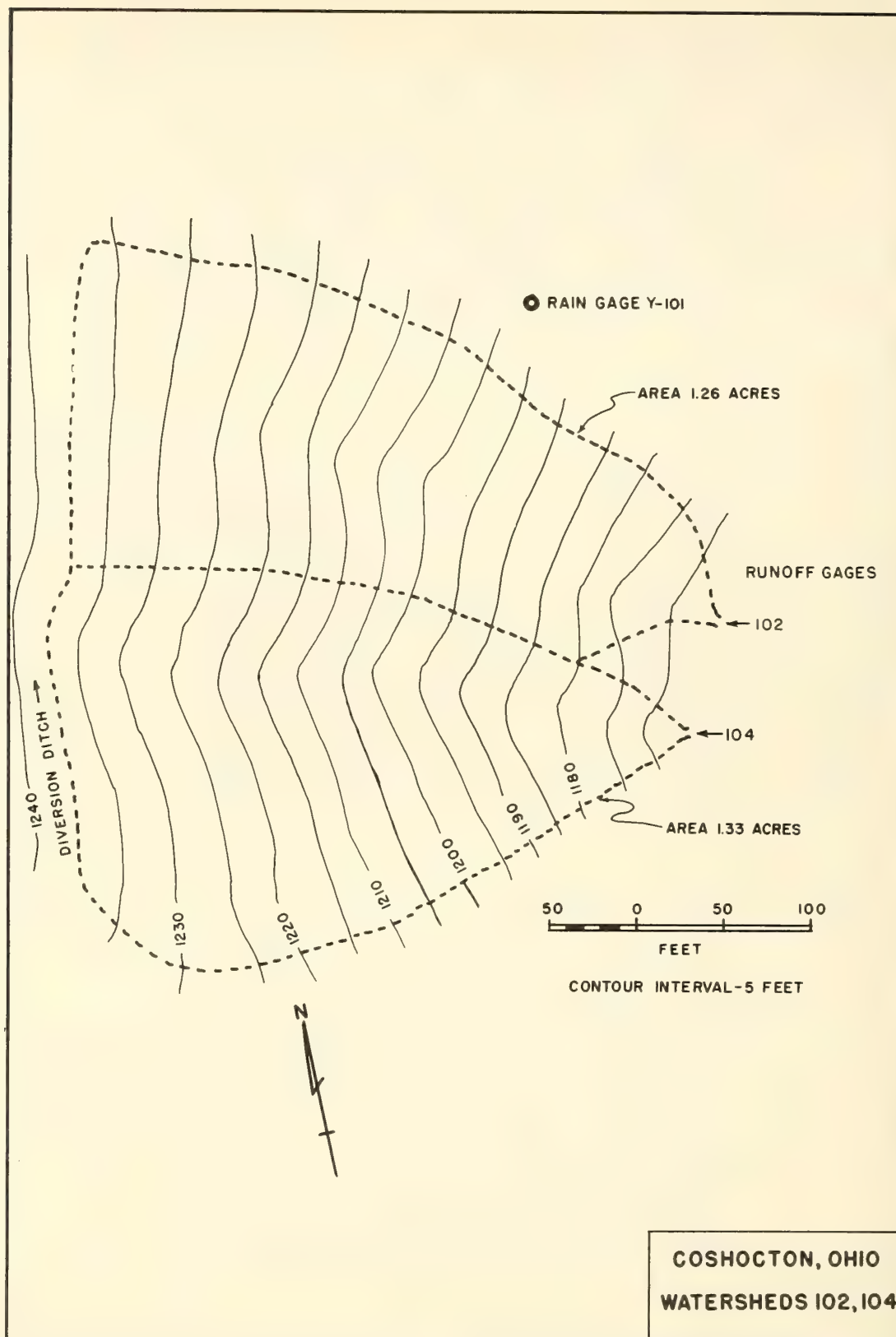


SELECTED RUNOFF EVENTS						Coshocton, Ohio, Watershed 102 (Area - 1.26 acres)		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	0	0	6-12-57	Raingage Y-101		6-12-57		
5-14	1.27	0	3:10p	0	0	3:25 p	0	0
5-15-21	.66a	0	:13	2.00	.10	:47	2.07	.16
5-22	.52	0	:20	1.46	.27	4:01	3.64	.87
			:30	2.52	.69	:11	.504	1.27
5-23-25	0	0	:34	4.80	1.01	:23	.0677	1.31
5-26	.18	0	:36	4.20	1.15	5:33	0	1.32
5-27-31	0	0	:40	3.60	1.39			
6-1	.16	0	:42	6.90	1.62			
6-2-7	0	0	:50	3.30	2.06			
6-8	1.01	0	4:00	4.86	2.87			
6-9-10	0	0	:30	.34	3.04			
6-11	.31	0	5:00	.18	3.13			
6-12	0	0	9:00	.01	3.17			
Watershed conditions: Cover consists of legumes (mostly birdsfoot trefoil), grass and weeds. Legumes and grass 5" high, weeds 8" high; density of cover 90%. Pastured by cattle under improved practice. Birdsfoot trefoil planted April 1957. Poverty grass cover 1936 to April 1957.								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage Y-101		6-28-57		
6-1	.16	0	1:07p	0	0	5:10p	0	0
6-2-7	0	0	:09	7.50	.25	:24	.0677	.01
6-8	1.01	0	:12	.60	.28	:30	.109	.02
6-9-10	0	0	:44	.04	.30	:40	.213	.05
6-11	.31	0	:47	2.40	.42	:56	.194	.10
6-12	3.18	1.32	:53	.10	.43	6:06	.291	.14
6-13	.45	.01	2:05	0	.43	:12	.291	.17
6-14	.16	0	:10	.84	.50	:20	.504	.22
6-15	0	0	:53	.13	.59	:26	.425	.27
6-16	.04	0	:59	1.20	.65	:36	.425	.33
6-17-18	0	0	3:24	.10	.69	:40	.559	.37
6-19	.02	0	:27	.60	.72	:44	.725	.41
6-20-22	0	0	4:28	.07	.79	:50	1.42	.52
6-23	.13	0	:31	.40	.81	:52	1.68	.57
6-24	2.11	.02	:33	2.40	.89	:54	1.76	.63
6-25-27	0	0	:39	.40	.93	:58	1.52	.74
6-28	.20 1/2	0	5:17	.19	1.05	7:06	.630	.87
			:31	.47	1.16	:12	.504	.93
			:38	.77	1.25	:16	.362	.96
			:45	.34	1.29	:26	.232	1.01
			:57	.50	1.39	:30	.158	1.02
			6:03	.70	1.46	:40	.125	1.04
			:12	.47	1.53	8:00	.0677	1.08
			:18	1.10	1.64	:20	.0236	1.09
			:37	.66	1.85	9:50	0	1.10
			:42	.84	1.92			
			:47	1.92	2.08			
			:50	3.00	2.23			
			:57	1.80	2.44			
			7:13	.52	2.58			
			:43	.28	2.72			
			:48	.12	2.73			
			8:03	.16	2.77			
Watershed conditions: Cover consists of legumes (mostly birdsfoot trefoil), grass and weeds. Legumes and grass 6" high, weeds 9" high; density of cover, 90%. Pastured by cattle under improved practice. Birdsfoot trefoil planted April 1957. Poverty grass cover 1936 to April 1957.								
Notes: 1/ Rain ended about 7:30a.								



COSHOCTON, OHIO WATERSHED 102





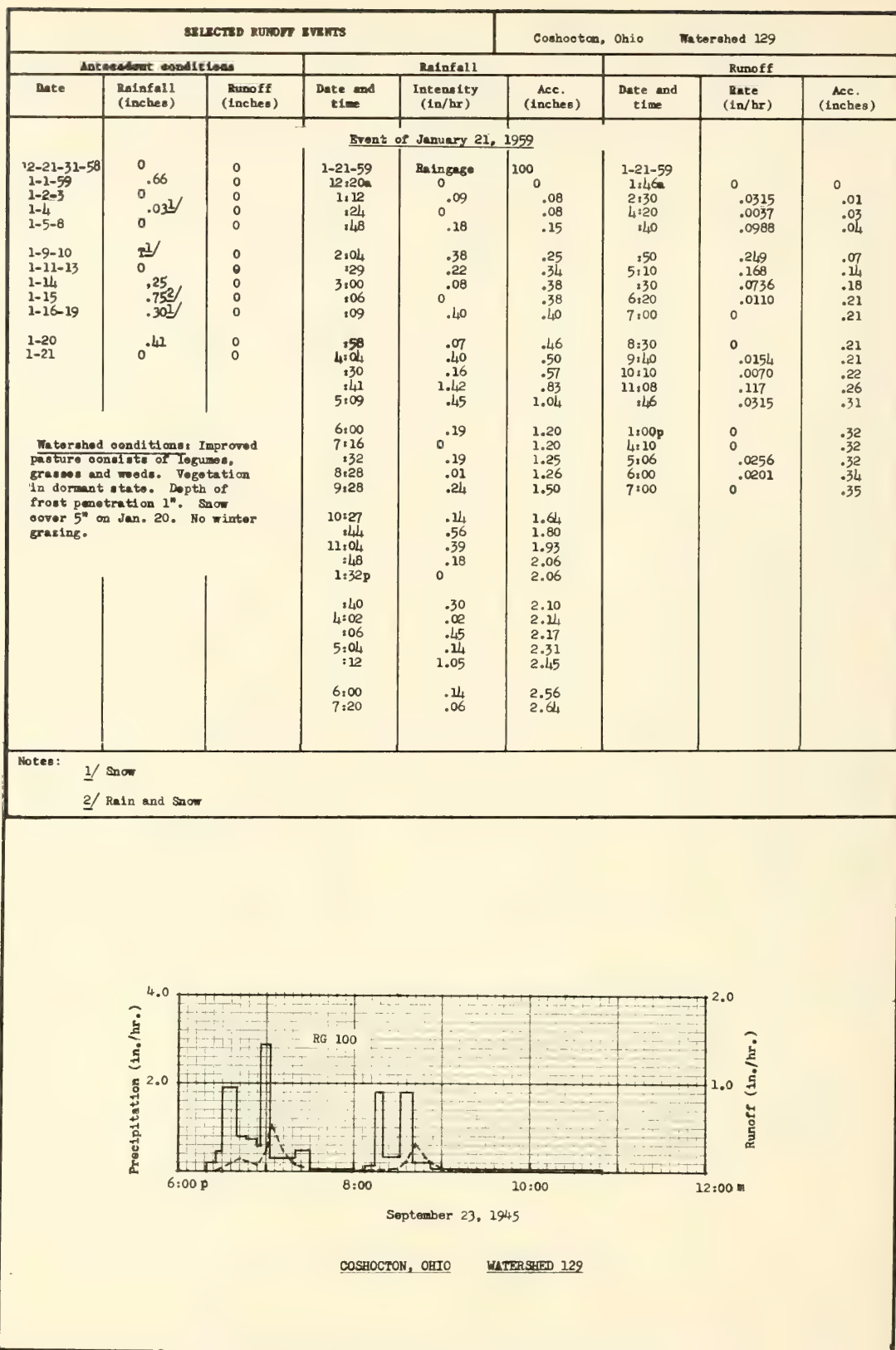
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 104 (Area - 1.33 acres)		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
event of September 23, 1945								
8-23-45	?	0	9-23-45	Raingage	Y-101	9-23-45		
8-24	.06	0	6:00p	0	0	6:30p	0	0
8-25-31	0	0	1:28	.04	.02	7:08	.183	.01
9-1	.15	0	1:32	.60	.06	1:14	.118	.03
9-2-7	0	0	1:36	2.25	.21	1:20	.118	.04
9-8	.50	0	1:40	1.50	.31	1:28	.0520	.05
9-9	.67	0	1:42	2.40	.39	1:38	.0141	.06
9-10	.73	0	1:50	.68	.48	8:00	0	.06
9-11	.18	0	1:56	.90	.57	1:30	0	.06
9-12	0	0	7:00	2.55	.74	1:50	.118	.06
9-13	.24	0	1:04	2.70	.92	1:56	.0891	.07
9-14	1.21	0	1:14	.36	.98	9:06	.0520	.08
9-15-16	0	0	1:24	.24	1.02	1:14	.0141	.09
9-17	.50	0	1:30	.70	1.09	10:00	0	.09
9-18	.99	0	8:12	.06	1.13			
9-19	0	0	1:16	0	1.13			
9-20	.54	0	1:20	1.80	1.25			
9-21-22	0	0	1:26	.40	1.29			
9-23	.53 1/2	0	1:33	.34	1.33			
			1:42	1.80	1.60			
			1:56	.17	1.64			
			9:32	.06	1.68			
			10:00	.04	1.70			
			1:20	0	1.70			
			1:36	.08	1.72			
			11:10	.02	1.73			
Watershed conditions: Improved pasture consists mostly of Kentucky blue grass with a small amount of red clover and a few weeds. Grass 3" high, clovers 2" high, and weeds 5" high; density of cover 90%.								
Notes: Watershed discontinued December 31, 1946. To convert runoff in in/hr to cfs, multiply by 1.341. The map for this watershed is included with Watershed 102, page 26.1-4. 1/ Most of rain occurred after 4:00p.								
<p style="text-align: center;">September 23, 1945</p> <p style="text-align: center;">COSHOCTON, OHIO      WATERSHED 104</p>								

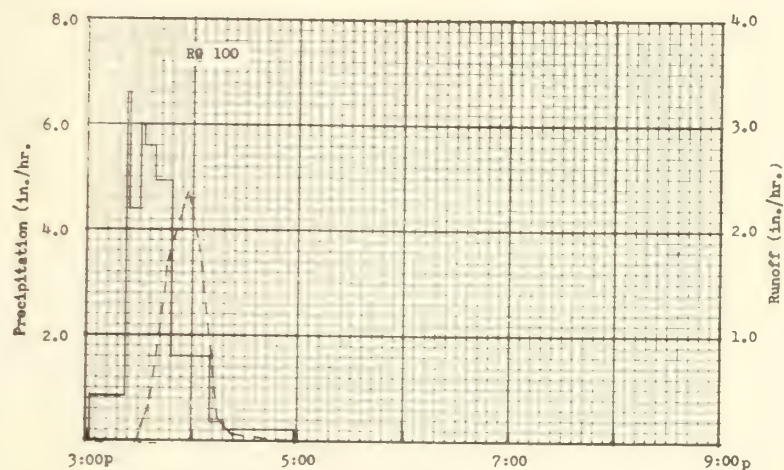
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 129 (Area - 2.71 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	1.68 0	5.52 .59	4.14 .01	4.00 0	6.79 0	5.09 .51	6.30 .36	3.94 .05	1.40 0	1.17 0	1.46 0	3.34 0	44.83 1.52			
1957 P Q	1.68 0	1.39 0	1.85 0	5.30 .05	4.07 0	10.71 1.75	3.46 0	1.86 T	3.85 .03	1.56 0	2.88 0	4.15 0	42.76 1.83			
1958 P Q	1.51 0	.77 0	1.05 0	3.66 0	3.02 .06	4.11 0	9.22 .18	2.70 0	3.12 0	.34 0	2.07 0	.80 0	32.37 .24			
1959 P Q	5.62 .35	3.03 .09	2.48 0	4.31 0	2.70 0	4.44 0	4.28 0	2.31 .05	3.06 0	4.92 0	2.67 0	2.16 0	41.98 .49			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshooton, Ohio Watershed 129								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	2.36	6-12	0.98	6-12	0.99	6-12	0.99	6-12	0.99	6-12	0.99	6-12	0.99	6-12	0.99
1958	7-31	.35	7-22	.09	7-22	.09	7-22	.09	7-22	.09	7-30	.09	7-30	.09	7-30	.09
1959	1-21	.25	1-21	.14	1-21	.17	1-21	.19	1-21	.32	1-21	.35	1-21	.35	1-21	.35
Notes: Quality of records; monthly P, excellent; monthly Q, good; annual maximum discharges and volumes, good. Cover 1956-1959, 100% improved practice pasture.																
SELECTED RUNOFF EVENTS								Coshooton, Ohio Watershed 129								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Rainage	100	9-23-45										
8-24	.06	0	6:20p	0	0	6:26p	0	0								
8-25-31	0	0	:26	.20	.02	:42	.146	.01								
9-1	.18	0	:30	.45	.05	:54	.0736	.03								
9-2-7	0	0	:40	1.92	.37	7:00	.234	.04								
9-8	.51	0	:46	.80	.45	:04	.527	.07								
9-9	.70	0	:54	.75	.55	:12	.234	.12								
9-10	.76	0	:56	.60	.57	:16	.126	.13								
9-11	.17	0	7:03	2.91	.91	:20	.0655	.14								
9-12	0	0	:20	.35	1.01	:30	.0315	.15								
9-13	.29	0	:30	.18	1.09	:50	.0037	.15								
9-14	1.13	.01	:58	.04	1.11	8:24	.0256	.16								
9-15-16	0	0	8:08	0	1.11	:30	.0315	.16								
9-17	.62	0	:15	.17	1.13	:36	.126	.17								
9-18	1.12	T	:19	1.80	1.25	:42	.322	.19								
9-19	0	0	:32	.37	1.33	:50	.157	.22								
9-20	.42	.01	:40	1.80	1.57	9:00	.0439	.24								
9-21-22	0	0	:52	.20	1.61	:10	.0154	.24								
9-23	.62 1/2	0	10:50	.04	1.69	10:20	0	.25								
Watershed conditions: Improved pasture consists mostly of alfalfa, timothy and bluegrass. Seeded to alfalfa May 12, 1945. Alfalfa 8" high, grass and weeds 8" high; density of cover 60%.																
Notes: To convert runoff in in/hr to cfs, multiply by 2.7326. 1/ Most of rain occurred after 4:20p.																

Cooperative research project of U. S. D. A. and Ohio Agricultural Experiment Station.

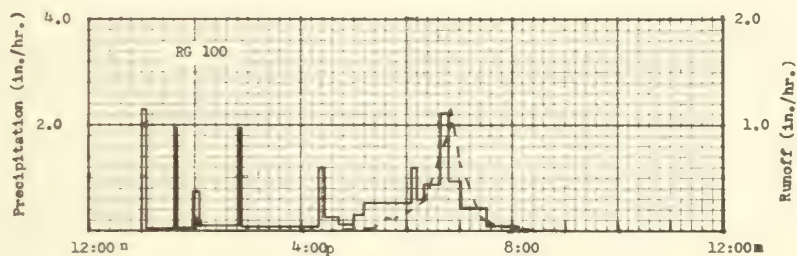
SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 129					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	0	0	6-12-57	Raingage	100	6-12-57		
5-14	1.18	0	3:02p	0	0	3:24p	0	0
5-15	.04	0	:22	.84	.28	:33	.212	.01
5-16-17	0	0	:24	6.60	.50	:35	.322	.01
			:30	4.40	.94	:45	1.65	.15
5-18	.18	0	:32	6.00	1.14	:53	2.13	.40
5-19	.20	0	:38	5.60	1.70	:57	2.36	.55
5-20	.19	0	:48	4.92	2.52	4:03	1.93	.77
5-21	0	0	4:10	1.61	3.11	:15	.212	.96
5-22	.49	0	:18	.38	3.16	:23	.0736	.98
5-23-25	0	0	:58	.21	3.30	:55	0	.99
5-26	.14	0	8:58	.01	3.32			
5-27-31	0	0						
6-1	.1	0						
6-2-7	0	0						
6-8	1.00	0						
6-9-10	0	0						
6-11	.30	0						
6-12	0	0						
Watershed conditions: Improved pasture consists of legumes, grass and weeds. Legumes and grasses 5" high, weeds 6" high; density of cover 100%. Grazed by cattle.								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage	100	6-28-57		
6-1	.14	0	1:00p	0	0	4:30p	0	0
6-2-7	0	0	:06	2.30	.23	5:24	.0315	.01
6-8	1.00	0	:37	.02	.24	:40	.135	.03
6-9-10	0	0	:41	1.95	.37	:48	.126	.05
6-11	.30	0	:59	.03	.38	6:04	.179	.09
6-12	3.32	.99	2:06	.77	.47	:20	.293	.15
6-13	.45	0	:50	.11	.55	:48	.963	.33
6-14	.07	0	:54	1.95	.68	:51	1.16	.39
6-15	0	0	4:21	.06	.77	7:00	.659	.53
6-16	.08	0	:28	1.20	.91	:24	.135	.66
6-17-18	0	0	:44	.26	.98	:34	.0816	.68
6-19	.02	0	5:00	.11	1.01	8:04	.0201	.71
6-20-22	0	0	:12	.30	1.07	:50	0	.71
6-23	.08	0	6:06	.54	1.56			
6-24	2.14	.05	:12	1.20	1.68			
6-25-27	0	0	:20	.60	1.76			
6-28	.21 1/2	0	:38	.37	2.02			
			:48	2.22	2.39			
			7:02	.94	2.61			
			:32	.42	2.80			
			8:10	.09	2.86			
Watershed conditions: Improved pasture consists of legumes, grass, and weeds. Legumes and grass 5" high, weeds 6" high; density of cover 100%. Grazed by cattle.								
Notes: 1/ Rain ended about 7:30a.								



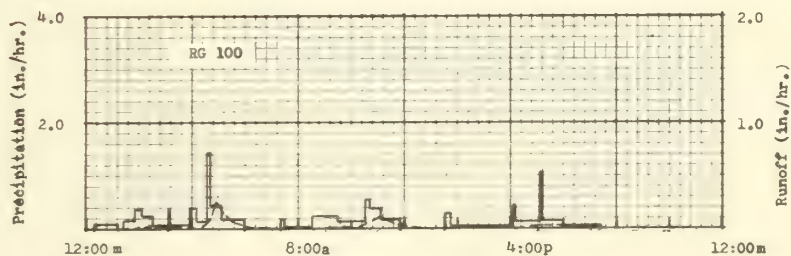




June 12, 1957

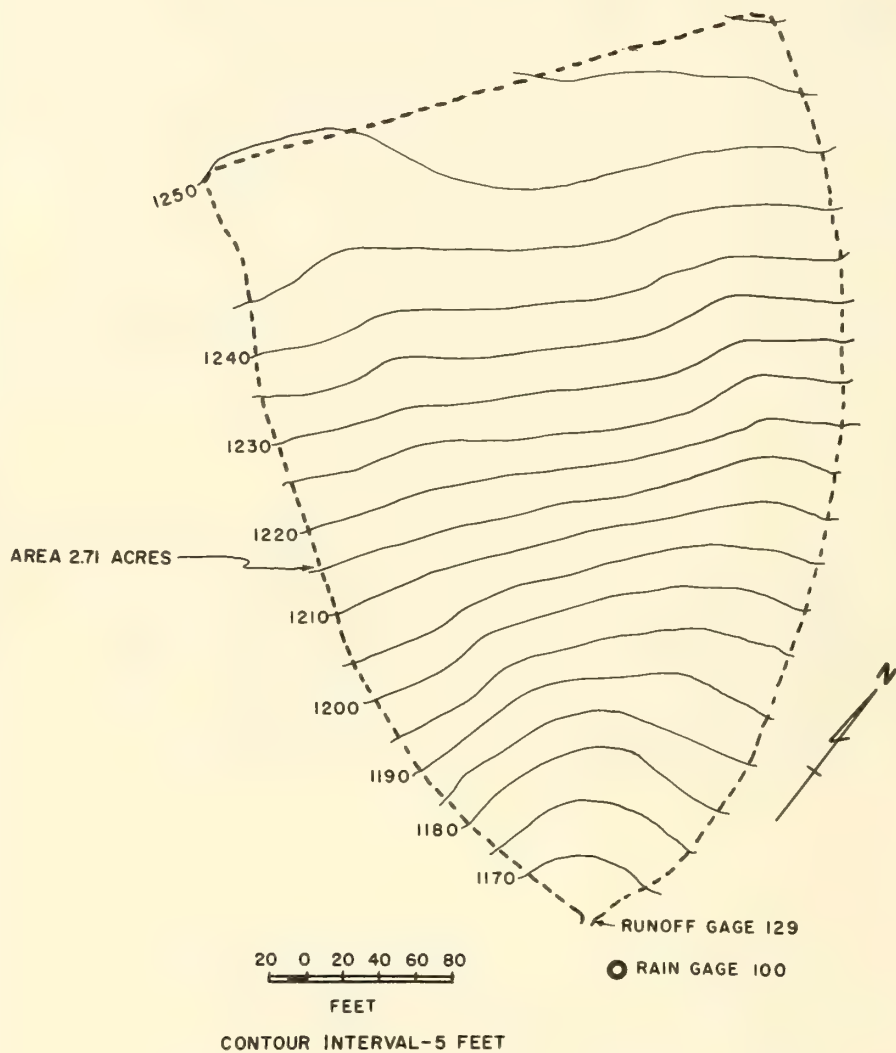


June 28, 1957



January 21, 1959

COSHOCOTON, OHIO WATERSHED 129



COSHOCTON, OHIO  
WATERSHED 129

1-50

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 135 (Area - 2.69 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1956 P Q	1.68 .19	5.52 .09	4.14 0	4.00 0	6.79 T	5.09 .17	6.30 .17	3.24 .05	1.40 .01	1.17 0	1.16 0	3.34 0	44.83 .68	
1957 P Q	1.68 .04	1.39 T	1.85 0	5.30 .01	4.07 0	10.71 1.59	3.46 0	1.86 0	3.85 .03	1.56 0	2.88 0	4.15 .01	42.76 1.68	
1958 P Q	1.51 .01	.77 0	1.05 0	3.66 0	3.02 0	4.11 0	9.22 .15	2.70 0	3.12 0	.34 0	2.07 0	.80 0	32.37 .16	
1959 P Q	5.32 .28	3.03 .05	2.48 0	4.31 T	2.70 0	4.44 .01	4.28 0	2.31 .02	3.06 0	4.92 0	2.67 0	2.16 0	41.98 .36	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Coshooton, Ohio Watershed 135

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	2.38	6-12	.92	6-12	.93	6-12	.93	6-12	.93	6-12	.93	6-12	.93	6-12	.93
1958	7-31	.32	7-22	.06	7-22	.06	7-22	.06	7-22	.06	7-30	.07	7-30	.07	7-30	.07
1959	1-21	.20	1-21	.11	1-21	.13	1-21	.15	1-21	.24	1-20	.27	1-20	.28	1-20	.28

Notes: Quality of Records: Monthly P, excellent; monthly Q, good; annual maximum discharges and volumes, good.  
Watershed conditions 1956-1959, 100% prevailing practice on unimproved pasture.

SELECTED RUNOFF EVENTS

Coshooton, Ohio Watershed 135

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 23, 1945								
8-23-45	T	0	9-23-45	Rainage	100	9-23-45		
8-24	.06	0	6:20p	0	0	6:30p	0	0
8-25-31	0	0	:26	.20	.02	:52	.136	.01
9-1	.18	0	:30	.45	.05	7:00	.108	.02
9-2-7	0	0	:40	1.92	.37	:08	.678	.07
9-8	.51	0	:46	.80	.45	:18	.236	.14
9-9	.70	0	:54	.75	.55	:24	.108	.16
9-10	.76	0	:56	.60	.57	:30	.0512	.17
9-11	.17	0	7:03	2.91	.91	8:10	.0070	.18
9-12	0	0	:20	.35	1.01	:42	.0995	.19
9-13	.29	0	:30	.48	1.09	:46	.350	.20
9-14	1.13	T	:58	.04	1.11	9:00	.127	.26
9-15-16	0	0	8:08	0	1.11	:10	.0376	.28
9-17	.62	0	:15	.17	1.13	10:20	0	.28
9-18	1.12	0	:19	1.80	1.25			
9-19	0	0	:32	.37	1.33			
9-20	.42	0	:40	1.80	1.57			
9-21	0	0	:52	.20	1.61			
9-22	0	0	10:50	.04	1.69			
9-23	.62 1/2	0						

Watershed conditions: Pre-vailing practice pasture consists mostly of timothy, poverty grass and weeds. Height of grass 30", weeds 36"; density of cover 90%.

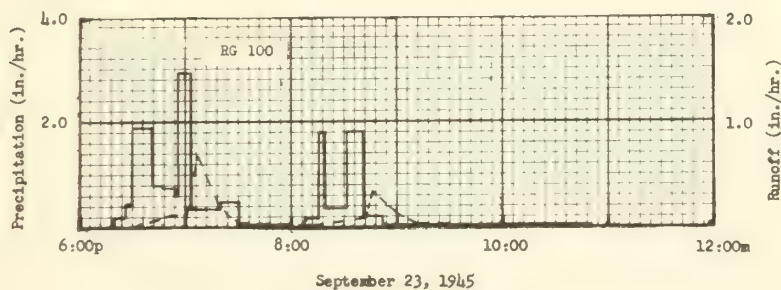
Notes: To convert runoff in in/hr to cfs, multiply by 2.7124.  
1/ Most of rain occurred after 3:20p.



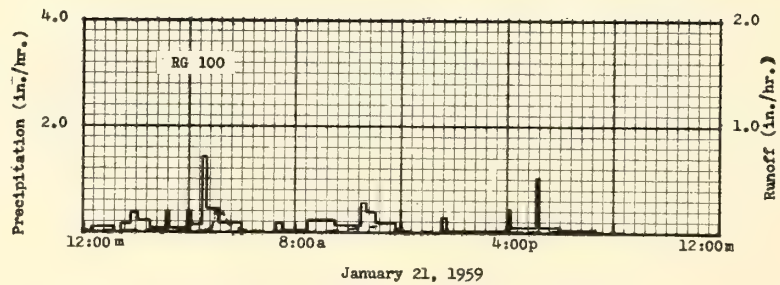
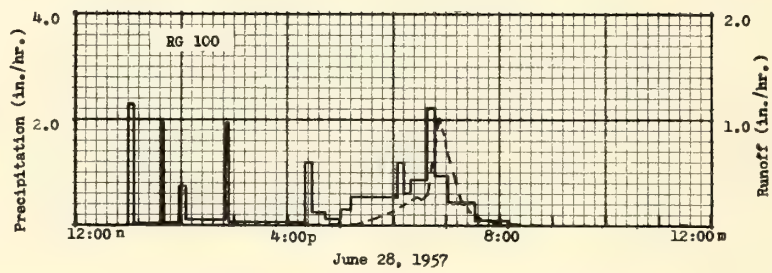
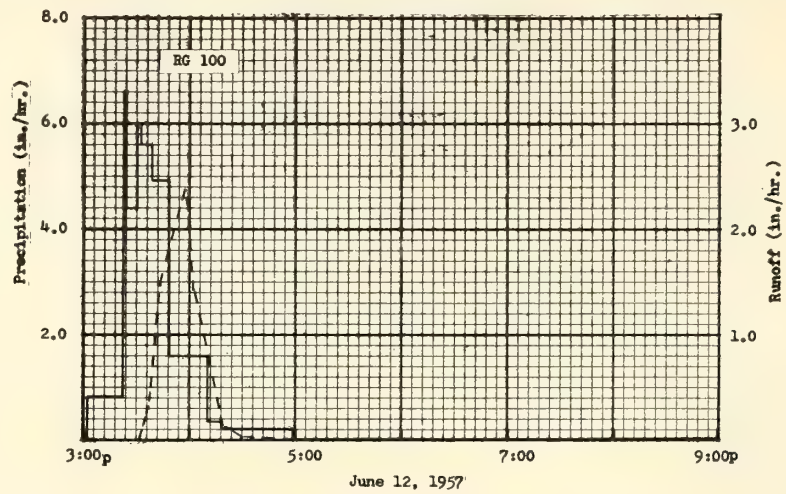
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 135		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 12, 1957</u>								
5-13-57	0	0	6-12-57	Rainage	100	6-12-57		
5-14	1.18	0	3:02p	0	0	3:32p	0	0
5-15	.04	0	:22	.84	.28	:37	.310	.01
5-16-17	0	0	:24	6.60	.50	:43	1.47	.11
			:30	4.40	.94	:57	2.38	.57
5-18	.18	0	:32	6.00	1.14	:59	2.20	.64
5-19	.20	0	:38	5.60	1.70	4:02	1.43	.74
5-20	.19	0	:48	4.92	2.52	:19	.147	.90
5-21	0	0	4:10	1.60	3.11	:29	.0442	.92
5-22	.49	0	:18	.38	3.16	5:09	0	.93
5-23-25	0	0	:58	.21	3.30			
5-26	.14	0	8:58	.01	3.32			
5-27-31	0	0						
6-1	.14	0						
6-2-7	0	0						
6-8	1.00	0						
6-9-10	0	0						
6-11	.30	0						
6-12	0	0						
Watershed conditions: Prevailing practice pasture consists of timothy, poverty grass and weeds. Height of grass 4", weeds 4"; density of cover 95%. Grazed by cattle.								
<u>Event of June 28, 1957</u>								
5-28-31-57	0	0	6-28-57	Rainage	100	6-28-57		
6-1	.14	0	1:00p	0	0	4:27p	0	0
6-2-7	0	0	:06	2.30	.23	5:20	.0111	.01
6-8	1.00	0	:37	.02	.24	:40	.0822	.02
6-9-10	0	0	:41	1.95	.37	6:00	.136	.06
6-11	.30	0	:59	.03	.38	:26	.284	.14
6-12	3.32	.93	2:06	.77	.47	:32	.262	.16
6-13	.45	0	:50	.11	.55	:40	.295	.20
6-14	.07	0	:54	1.95	.68	:52	1.01	.31
6-15	0	0	4:21	.06	.77	:58	.859	.41
6-16	.08	0	:28	1.20	.91	7:00	.730	.43
6-17-18	0	0	:44	.26	.98	:18	.236	.56
6-19	.02	0	5:00	.11	1.01	:28	.127	.59
6-20-22	0	0	:12	.30	1.07	:40	.0741	.61
6-23	.08	0	6:06	.54	1.56	8:00	.0258	.63
6-24	2.14	.03	:12	1.20	1.63	:48	0	.63
6-25-27	0	0	:20	.60	1.76			
6-28	.21 1/2	0	:38	.87	2.02			
			:48	2.22	2.39			
			7:02	.94	2.61			
			:32	.42	2.80			
			8:10	.09	2.86			
Watershed conditions: Prevailing practice pasture consists of timothy, poverty grass and weeds. Height of grass 4", weeds 4", density of cover 95%. Grazed by cattle.								
Notes: 1/ Rain ended about 7:30a.								

SELECTED RUNOFF EVENTS						Coshocton, Ohio      Watershed 135		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Raingage	1.00	1-21-59		
12-23	T 1/	0	12:20a	0	0	12:01a	0.0037	0
12-24	T 1/	0	1:12	.09	.08	2:34	.0111	.01
12-25-31	0	0	1:24	0	.08	4:34	.0037	.02
1-1-59	.66	0	1:48	.18	.15	1:50	.0317	.03
1-2-3	0	0	2:04	.38	.25	1:58	.199	.04
1-4	.03 1/	0	1:29	.22	.34	5:06	.136	.06
1-5-8	0	0	3:00	.08	.38	1:14	.181	.08
1-9	T 1/	0	1:06	0	.38	1:34	.0822	.12
1-10	T 1/	0	1:09	.40	.40	6:04	.0203	.15
1-11-13	0	0	1:58	.07	.46	8:24	0	.16
1-14	.25	0	4:04	.40	.50	1:34	0	.16
1-15	.75 2/	0	1:30	.16	.57	11:04	.0586	.17
1-16-19	.30	0	1:41	1.42	.83	1:24	.0995	.20
1-20	.41	.02	5:09	.45	1.04	12:00a	.0203	.23
Watershed conditions: Prevailing practice pas- ture consists of timothy, poverty grass and weeds. Vegetation in dormant state. Depth of frost penetration, 1". No winter grazing. Snow cover was 5" on Jan. 20.			6:00	.19	1.20	1:14p	.0111	.24
			7:16	0	1.20	2:14	0	.25
			1:32	.19	1.25	4:24	0	.25
			8:28	.01	1.26	5:48	.0203	.25
			9:28	.24	1.50	8:24	0	.26
			10:27	.14	1.64			
			1:44	.56	1.80			
			11:04	.39	1.93			
			1:48	.18	2.06			
			1:32p	0	2.06			
			1:40	.30	2.10			
			4:02	.02	2.14			
			1:06	.45	2.17			
			5:04	.14	2.31			
			1:12	1.05	2.45			
			6:00	.14	2.56			
			7:20	.06	2.64			

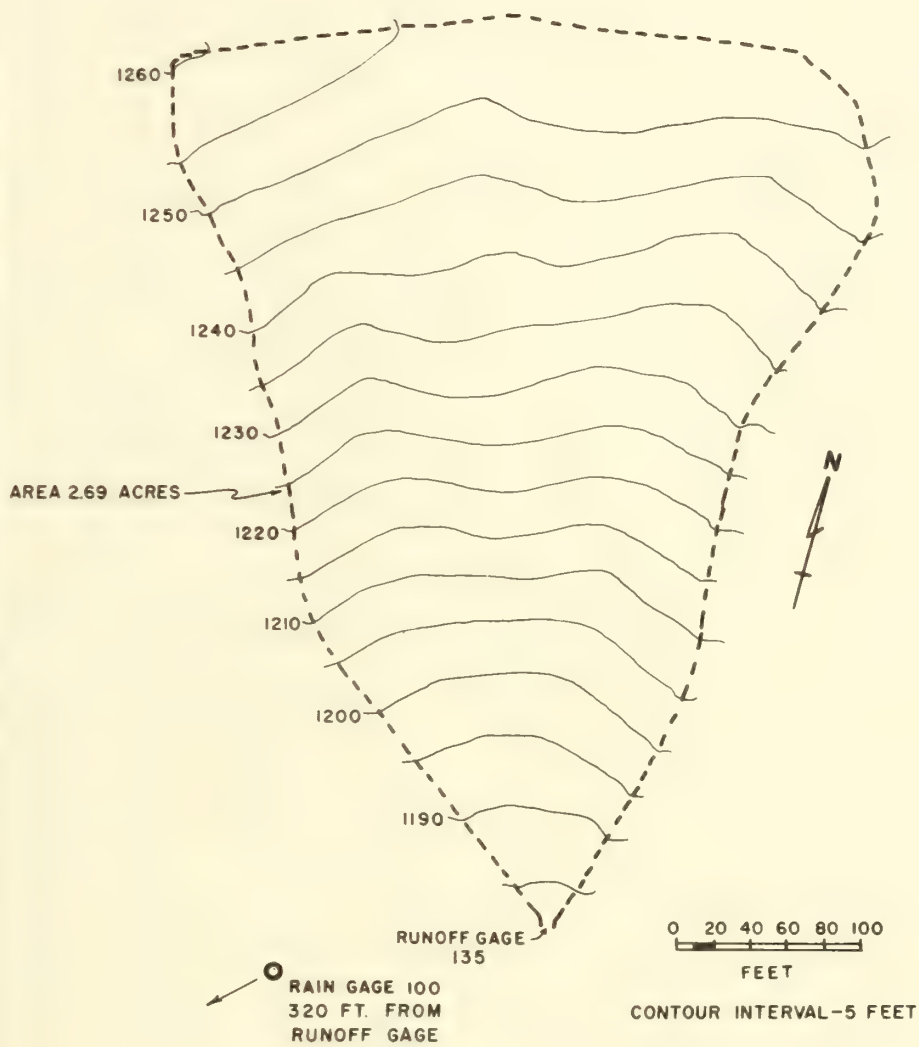
Notes: 1/ Snow  
2/ Rain and snow



COSHOCTON, OHIO      WATERSHED 135



COSHOCTON, OHIO WATERSHED 135



COSHOCTON, OHIO  
WATERSHED 135



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 130 (Area - 1.63 acres)								
Month Year		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.47	5.22	3.80	3.85	6.87	4.61	6.44	3.86	1.34	1.09	1.45	3.36	43.36		
	Q	.23	1.10	.01	0	T	.22	.25	0	0	0	0	0	1.81		
1957	P	1.58	1.31	1.79	4.91	4.07	10.80	3.53	1.99	3.90	1.58	2.74	4.07	42.27		
	Q	.02	0	0	.28	0	2.53	0	0	0	0	0	.07	2.90		
1958	P	1.49	.74	.94	3.53	3.01	4.10	9.16	2.86	3.18	.29	2.09	.80	32.19		
	Q	.07	.25	0	.04	.17	0	.53	0	0	0	0	0	1.06		
1959	P	5.87	2.78	2.44	4.24	2.72	4.35	4.45	2.28	2.89	4.87	2.62	1.94	41.45		
	Q	1.10	.29	T	.12	T	.01	0	.09	0	0	0	T	1.61		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 130								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	4.06	6-12	1.42	6-12	1.44	6-12	1.44	6-12	1.44	6-12	1.44	6-12	1.44	6-12	1.44
1958	7-22	.85	7-22	.24	7-22	.24	7-22	.24	7-22	.24	7-22	.24	7-22	.24	2-21	.25
1959	1-21	.44	1-21	.30	1-21	.38	1-21	.64	1-21	.93	1-20	1.10	1-20	1.10	1-20	1.10
Notes: Quality of Records: Monthly P, excellent; Monthly Q, good; annual maximum discharges and volumes, good. Cover 1955-1959, 100% improved practice meadow.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 130								
Antecedent conditions				Rainfall					Runoff							
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)						
Event of September 23, 1945																
8-23-45	T	0		9-23-45	Rain gauge 103			9-23-45								
8-24	.05	0		6:24p	0	0		6:24p	0	0						
8-25-31	0	0		:28	.45	.03		:48	.0852	.01						
9-1	.16	0		:32	1.05	.10		:56	.116	.03						
9-2-7	0	0		:34	4.20	.24		7:00	.341	.04						
9-8	.55	0		:41	1.80	.45		:06	.852	.11						
9-9	.73	0		:55	.64	.60		:12	.572	.13						
9-10	.68	0		7:02	3.17	.97		:24	.213	.25						
9-11	.21	0		:14	.70	1.11		:30	.158	.27						
9-12	0	0		:24	.30	1.16		:38	.0730	.29						
9-13	.29	0		:30	.50	1.21		:50	.0249	.30						
9-14	1.09	0		8:14	.04	1.24		8:12	.0085	.30						
9-15-16	0	0		:18	1.65	1.35		:30	.0608	.31						
9-17	.56	0		:32	.47	1.46		:36	.237	.33						
9-18	1.04	0		:36	1.80	1.58		:40	.493	.35						
9-19	0	0		:40	2.10	1.72		9:00	.116	.45						
9-20	.38	0		9:30	.12	1.82		:08	.0548	.46						
9-21-22	0	0		10:42	.04	1.87		:30	.0146	.48						
9-23	.70 1/2	0						11:00	0	.48						
Watershed conditions: Improved practice meadow. Cover consists of alfalfa (seeded in 1940 and reseeded in 1942) and timothy. Alfalfa 6" high, grass 6", weeds 8"; density of cover 85%.																
Notes: To convert runoff in in/hr to cfs, multiply by 1.4736. 1/ Most of rain occurred after 4:24p.																

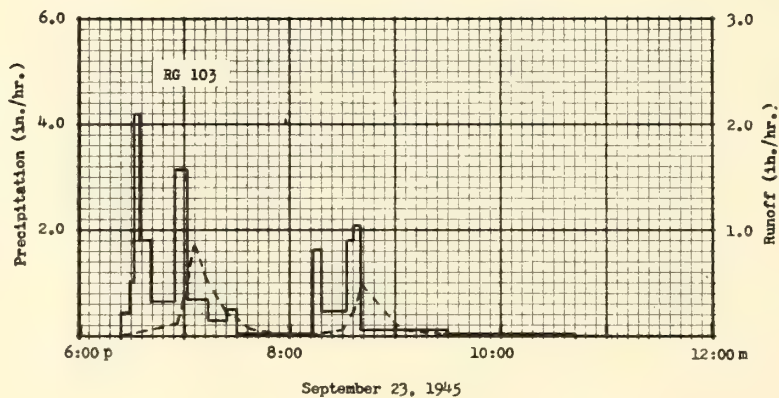
SELECTED RUNOFF EVENTS					Coshooton, Ohio Watershed 130			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	0	0	6-12-57	Raingage 103		6-12-57		
5-14	1.12	0	3:07p	0	0	3:25p	0	0
5-15	.04	0	:12	1.20	.10	:29	.237	.01
5-16-17	0	0	:19	1.11	.23	:37	1.33	.09
			:22	.20	.24	:42	2.34	.23
5-18	.18	0	:24	2.10	.31	:47	2.10	.42
5-19	.20	0	:30	4.90	.80	:55	4.06	.83
5-20	.19	0	:40	5.58	1.73	4:01	2.47	1.18
5-21	0	0	:48	3.15	2.15	:13	.298	1.38
5-22	.51	0	:51	7.80	2.54	:19	.158	1.11
5-23-25	0	0	4:12	1.77	3.16	:23	.0913	1.42
5-26	.14	0	:14	1.20	3.20	:33	.0389	1.43
5-27-31	0	0	:19	.24	3.22	5:37	0	1.44
6-1	.18	0	:22	0	3.22			
6-2-7	0	0	:40	.33	3.32			
6-8	.98	0	5:28	.05	3.36			
6-9-10	0	0						
6-11	.30	0						
6-12	0	0						
Watershed conditions: Improved practice meadow. Cover consists of legumes and grasses. Cut for hay May 28, 1957. Legumes 4", grasses 4", weeds 5"; density of cover 100%.								
Event of June 28, 1957								
5-22-31-57	0	0	6-28-57	Raingage 103		6-28-57		
6-1	.18	0	12:56p	0	0	4:30p	0	0
6-2-7	0	0	1:00	3.45	.23	5:10	.0389	.02
6-8	.98	0	:32	.08	.27	:20	.0608	.03
6-9-10	0	0	:36	1.35	.36	:30	.134	.04
6-11	.30	0	:53	.04	.37	:38	.237	.07
6-12	3.30	1.44	2:01	.75	.47	:54	.213	.09
6-13	.45	0	:28	.02	.48	6:00	.268	.12
6-14	.04	0	:46	.23	.95	:10	.268	.16
6-15	0	0	:50	1.95	.68	:16	.108	.19
6-16	.12	0	4:18	.07	.78	:34	.108	.32
6-17-18	0	0	:24	1.20	.90	:52	1.13	.57
6-19	.02	0	5:08	.23	1.07	7:00	.900	.73
6-20-22	0	0	5:04	.55	1.58	:04	.645	.78
6-23	.10	0	:09	1.44	1.70	:18	.298	.89
6-24	2.22	.09	:32	.65	1.95	:30	.158	.93
6-25	.03	0	:40	1.95	2.21	:58	.0548	.98
6-26-27	0	0	:45	1.56	2.34	8:30	.0146	1.00
6-28	.20 1/2	0	:49	1.80	2.46	9:50	0	1.01
			7:00	.65	2.58			
			:16	.30	2.66			
			:48	.17	2.75			
			8:40	.03	2.78			
Watershed conditions: Improved practice meadow. Cover consists of legumes and grasses. Legumes 6" high, grasses 6", weeds 6". Density of cover 100%.								
Notes: 1/ Rain ended about 7:30a.								

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 130		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Rain gauge 103	0	1-21-59		
12-23	1/	0	12:01a	0	0	12:01a	0.0085	0
12-24	1/	0	1:52	.06	.05	1:30	.0146	.01
12-25-31	0	0	1:04	0	.05	2:00	.0913	.06
1-1-59	.62	0	1:24	.09	.08	1:24	.134	.11
1-2-3	0	0	2:32	.23	.34	3:02	.0730	.18
1-4	.02 1/	0	3:08	.10	.40	4:00	.0389	.24
1-5-8	0	0	1:58	.07	.46	1:46	.268	.29
1-9-10	1/	0	4:28	.22	.57	1:55	.144	.34
1-11-13	0	0	1:44	1.28	.91	5:30	.213	.53
1-14	.25	0	5:08	.40	1.07	6:08	.0913	.62
1-15	.73 2/	0	1:48	.20	1.20	8:30	.0049	.67
1-16-19	.30 1/	0	7:52	.05	1.30	9:24	.0322	.68
1-20	.54	.0410	8:30	0	1.30	1:52	.0548	.70
			9:28	.26	1.55	10:28	.0389	.72
			10:00	.21	1.66	1:40	.0852	.73
			1:26	.16	1.73	11:04	.158	.78
			1:44	.57	1.90	1:12	.225	.81
			11:00	.41	2.01	1:30	.116	.87
			1:28	.24	2.12	1:50	.0852	.91
			1:48	.36	2.24	12:00a	.0548	.92
			1:32p	0	2.24	1:30p	0	.94
			4:40	.06	2.43	5:14	.0548	.95
			5:01	.20	2.50	1:40	.116	.99
			1:14	.74	2.66	6:08	.0548	1.03
			1:54	.18	2.78	9:30	0	1.06
			7:00	.03	2.81			

Notes:

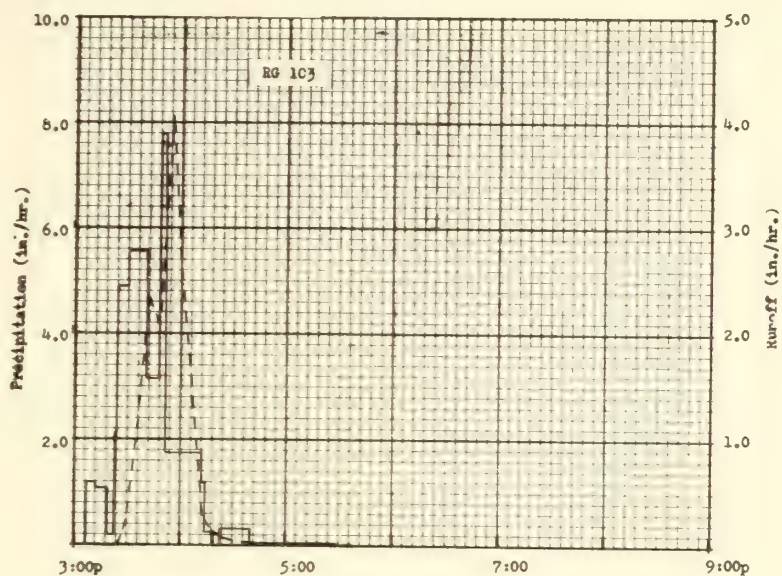
1/ Snow

2/ Rain and Snow

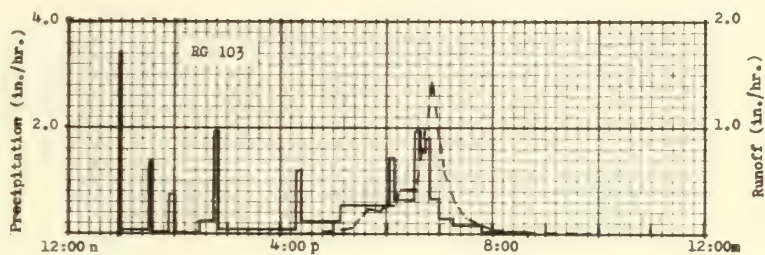


COSHOCTON, OHIO

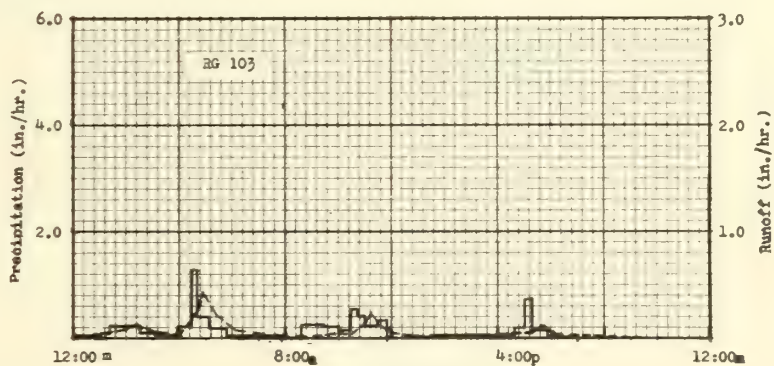
WATERSHED 130



June 12, 1957



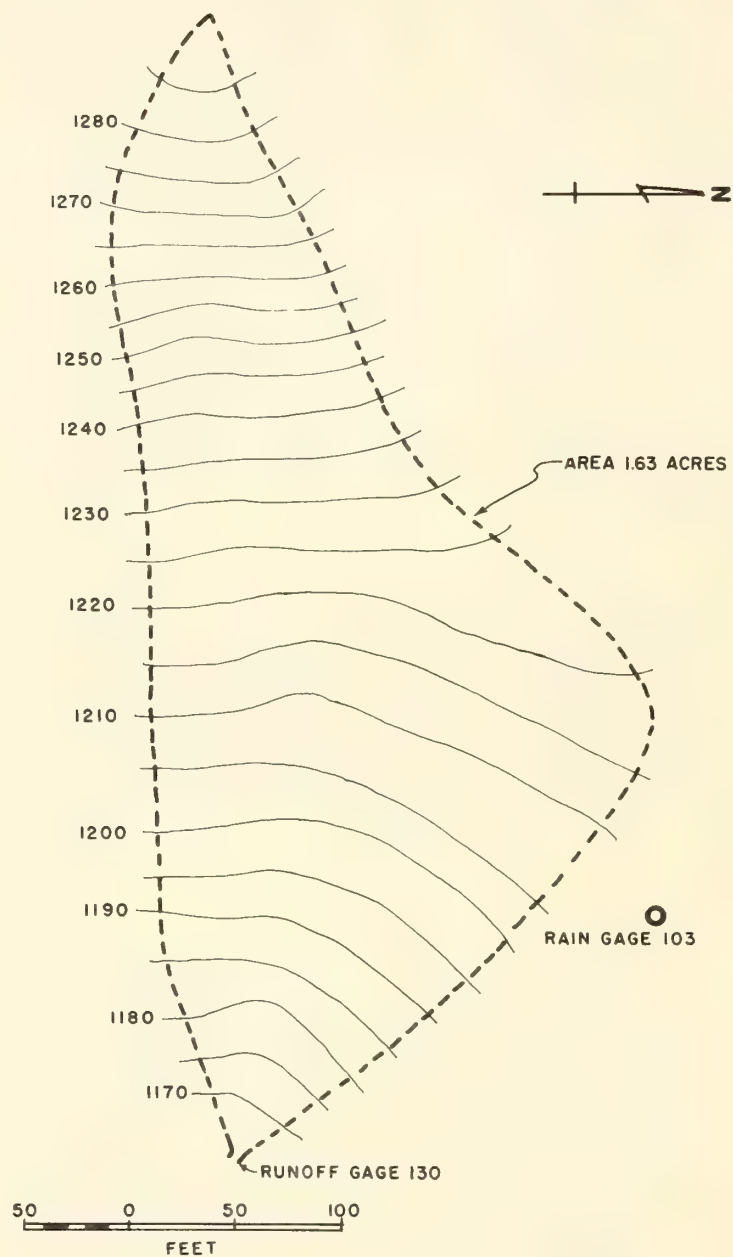
June 28, 1957



January 21, 1959

COHOCTON, OHIO      WATERSHED 130



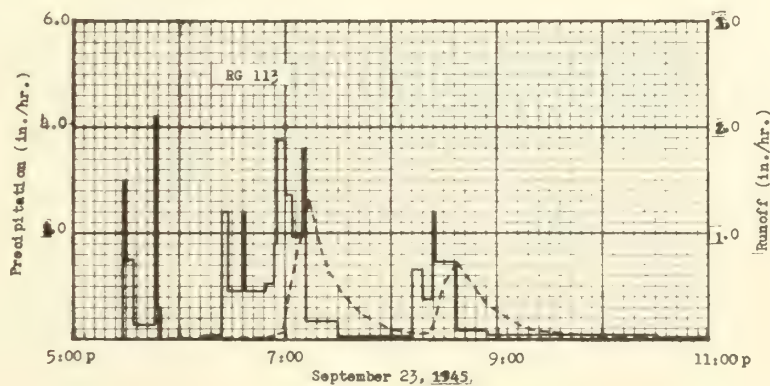


CONTOUR INTERVAL-5 FEET

COSHOCTON, OHIO  
WATERSHED 130

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 107 (Area - 2.59 acres)					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 23, 1945								
8-23-45	T	0	9-23-45	Raingage	113	9-23-45		
8-24	.06	0	5:28p	0	0	5:32p	0	0
8-25-31	0	0	1:30	3.00	.10	6:48	.0095	T
9-1	.17	0	1:34	1.50	.20	1:54	.0357	T
9-2-7	0	0	1:46	.25	.25	1:58	.0574	.01
9-8	.76	T	1:48	1.20	.39	7:04	.620	.03
9-9	.96	0	1:50	.60	.41	1:14	1.31	.20
9-10	.72	0	6:14	0	.41	1:18	1.01	.28
9-11	.04	0	1:24	.06	.42	1:24	.685	.37
9-12	0	0	1:28	2.40	.58	1:32	.437	.64
9-13	.29	0	1:36	.90	.70	1:42	.247	.50
9-14	1.20	.01	1:38	2.40	.78	1:58	.100	.54
9-15-16	0	0	1:50	.90	.96	8:16	.0459	.56
9-17	.50	0	1:54	1.05	1.03	1:22	.0613	.56
9-18	1.01	.04	1:56	1.80	1.09	1:26	.212	.57
9-19	0	0	7:00	3.75	1.34	1:30	.528	.60
9-20	.49	0	1:04	2.70	1.52	1:38	.720	.68
9-21-22	0	0	1:10	1.90	1.71	1:54	.328	.82
9-23	.28 1/2	0	1:12	3.60	1.83	9:14	.118	.88
			1:30	.33	1.93	1:24	.0796	.90
			8:12	.03	1.95	1:38	.0532	.92
			8:18	1.30	2.08	10:02	.0326	.93
			1:23	.72	2.14	1:38	.0171	.95
			1:26	2.40	2.26	9-24-45		
			1:38	1.45	2.55	12:18a	.0038	.96
			1:56	.17	2.60			
			10:32	.06	2.69			
			12:00m	.01	2.70			

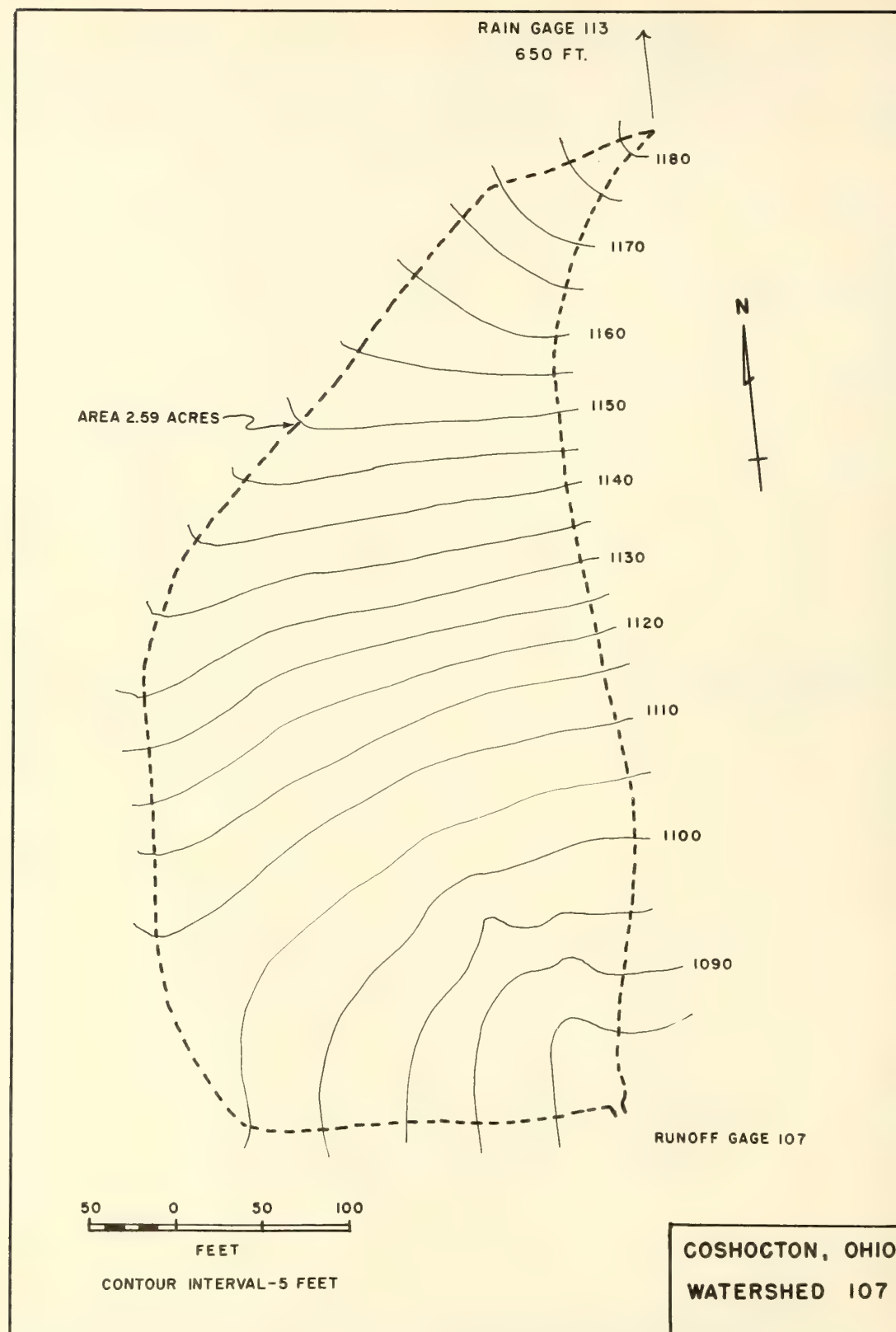
Watershed conditions: Pine stand due to reforestation in 1939. Pines 9 ft. high. Shrubs 1-8'. Weeds 15" high; grass 8", clover 3". No grazing.



COSHOCTON, OHIO WATERSHED 107

Notes: To convert runoff in in./hr to cfs, multiply by 2.6116.  
Watershed discontinued February 28, 1946.  
1/ Most of rain occurred after 3:28p.

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 131 (Area - 2.21 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	1.47 0	5.22 .11	3.80 0	3.85 0	6.87 0	4.61 T	6.44 0	3.86 0	1.34 0	1.09 0	1.45 0	3.36 0	43.36 .11			
1957 P Q	1.58 0	1.31 0	1.79 0	4.91 0	4.07 0	10.80 .75	3.53 0	1.99 0	3.90 0	1.58 0	2.74 0	4.07 0	42.27 .75			
1958 P Q	1.49 0	.74 0	.94 0	3.53 0	3.01 0	4.10 0	9.16 0	2.86 0	3.18 0	.29 0	2.09 0	.80 0	32.19 0			
1959 P Q	5.87 .41	2.78 .06	2.44 0	4.24 .01	2.72 0	4.35 0	4.45 0	2.28 0	2.89 0	4.87 0	2.62 0	1.94 0	41.45 .48			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 131								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	1.18	6-12	0.41	6-12	0.45	6-12	0.45	6-12	0.45	6-12	0.45	6-12	0.45	6-12	0.45
1958		0		0		0		0		0		0		0		0
1959	1-21	.07	1-21	.07	1-21	.11	1-21	.20	1-21	.35	1-21	.41	1-21	.41	1-21	.41
Notes: Quality of records: monthly P, excellent; monthly Q, good; annual maximum discharges and volumes, good. Cover 1956-1959, 100% uneven age hardwoods.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 131								
Antecedent conditions			Rainfall						Runoff							
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Rainage	103	9-23-45										
8-24	.05	0	6:24p	0	0	7:00p	0	0								
8-25-31	D	0	:28	.45	.03	:14	.0875	.01								
9-1	.16	0	:32	1.05	.10	:30	.0538	.03								
9-2-7	0	0	:34	4.20	.24	:50	.0215	.04								
9-8	.55	0	:41	1.80	.45	8:16	.0050	.05								
9-9	.73	0	:55	.64	.60	:38	.0185	.05								
9-10	.68	0	7:02	3.17	.97	:46	.101	.06								
9-11	.21	0	:14	.70	1.11	:50	.0812	.07								
9-12	0	0	:24	.30	1.16	9:00	.0538	.08								
9-13	.29	0	:30	.50	1.21	:10	.0346	.09								
9-14	1.09	0	8:14	.04	1.24	:30	.0180	.10								
9-15-16	0	0	:18	1.65	1.35	10:10	.0050	.10								
9-17	.56	0	:32	.47	1.46	12:00m	0	.11								
9-18	1.04	0	:36	1.80	1.58											
9-19	0	0	:40	2.10	1.72											
9-20	.38	0	9:30	.12	1.82											
9-21-22	0	0	10:42	.04	1.87											
9-23	.70 1/	0														
Watershed conditions: Uneven age stand of hardwoods: good woodland management; no grazing. Trees up to 80'. Shrubs 8'. Herbs 30". Litter 1/2".																
Notes: To convert runoff in in/hr to cfs, multiply by 2.2284. 1/ Most of rain occurred after 4:24p.																

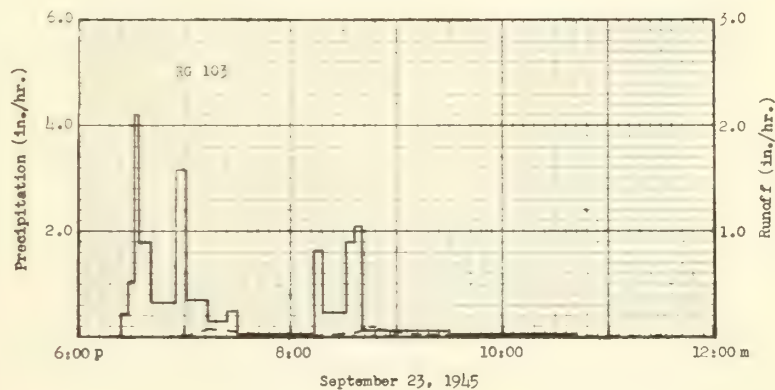
Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station.



SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 131		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
			6-12-57	Raingage	103	6-12-57		
5-13-57	0	0	3:07p	0	0	3:43p	0	0
5-14	1.12	0	:12	1.20	.10	:47	.390	.01
5-15	.04	0	:19	1.11	.23	:49	.610	.03
5-16-17	0	0	:22	.20	.24	:51	.924	.06
5-18	.18	0	:24	2.10	.31	:56	1.18	.15
5-19	.20	0	:30	4.90	.80	4:00	.951	.22
5-20	.19	0	:40	5.58	1.73	:09	.390	.32
5-21	0	0	:48	3.15	2.15	:31	.107	.39
5-22	.51	0	:51	7.80	2.54	:51	.059	.42
5-23-25	0	0	4:12	1.77	3.16	7:00	0	.45
5-26	.14	0	:14	1.20	3.20			
5-27-31	0	0	:19	.24	3.22			
6-1	.18	0	:22	0	3.22			
6-2-7	0	0	:40	.33	3.32			
6-8	.98	0	5:28	.05	3.36			
6-9-10	0	0						
6-11	.30	0						
6-12	0	0						
Watershed conditions: Uneven age stand of hardwoods; good woodland management; no grazing. Trees up to 80'. Shrubs 36", herbs 18", Litter 1/2".								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage	103	6-28-57		
6-1	.18	0	12:56p	0	0	5:46p	0	0
6-2-7	0	0	1:00	3.45	.23	6:12	.0440	.01
6-8	.98	0	:32	.08	.27	:28	.0749	.03
6-9-10	0	0	:36	1.35	.36	:48	.251	.07
6-11	.30	0	:53	.04	.37	:52	.328	.09
6-12	3.36	.45	2:01	.75	.47	7:12	.193	.17
6-13	.45	0	:28	.02	.48	8:12	.0410	.27
6-14	.04	0	:46	.23	.55	9:02	.0113	.30
6-15	0	0	:50	1.95	.68	10:52	0	.30
6-16	.12	0	4:18	.07	.78			
6-17-18	0	0	:24	1.20	.90			
6-19	.02	0	5:08	.23	1.07			
6-20-22	0	0	6:04	.55	1.58			
6-23	.10	0	:09	1.44	1.70			
6-24	2.22	0	:32	.65	1.95			
6-25	.03	0	:40	1.95	2.21			
6-26-27	0	0	:45	1.56	2.34			
6-28	.201/	0	:49	1.80	2.46			
			7:00	.65	2.58			
			:16	.30	2.66			
			:48	.17	2.75			
			8:40	.03	2.78			
Watershed conditions: Uneven age stand of hardwoods; good woodland management; no grazing. Trees up to 80'. Shrubs 36", herbs 18", litter 1/2".								
Notes: 1/ Rain ended about 7:30a.								

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 131					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Raingage	103	1-21-59		
12-23	T 1/	0	12:01a	0	0	12:30a	0	0
12-24	T 1/	0	1:52	.06	.05	3:30	.0301	.01
12-25-31	0	0	1:04	0	.05	4:28	.0256	.04
1-1-59	.62	0	1:24	.09	.08	5:00	.0642	.06
1-2-3	0	0	2:32	.23	.34	1:10	.0749	.07
1-4	.02 2/	0	3:08	.10	.40	1:30	.0642	.10
1-5-8	0	0	1:58	.07	.46	7:10	.0180	.17
1-9-10	T 1/	0	4:28	.22	.57	8:50	.0180	.19
1-11-13	0	0	1:44	1.28	.91	10:00	.0301	.22
1-14	.25	0	5:08	.40	1.07	11:00	.0592	.26
1-15	.73 2/	0	1:48	.20	1.20	1:18	.0642	.28
1-16-19	.30 2/	0	7:52	.05	1.30	1:30p	.0081	.35
1-20	.54	0	8:30	0	1.30	5:02	.0050	.36
			9:28	.26	1.55	1:40	.0215	.37
			10:00	.21	1.66	11:00	0	.41
			1:26	.16	1.73			
			1:44	.57	1.90			
			11:00	.41	2.01			
			1:28	.24	2.12			
			1:48	.36	2.24			
			1:32p	0	2.24			
			4:40	.06	2.43			
			5:01	.20	2.50			
			1:14	.74	2.66			
			1:54	.18	2.78			
			7:00	.03	2.81			

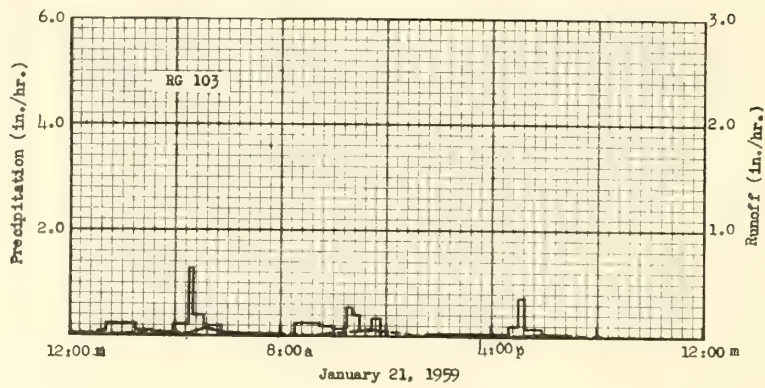
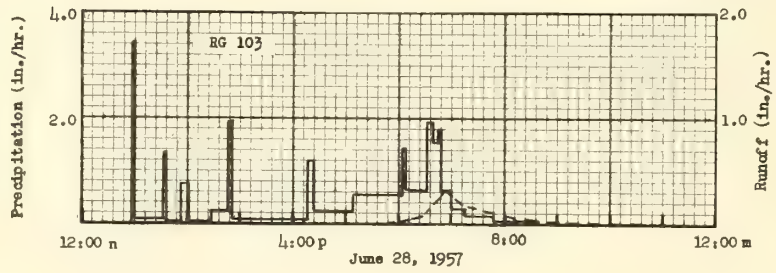
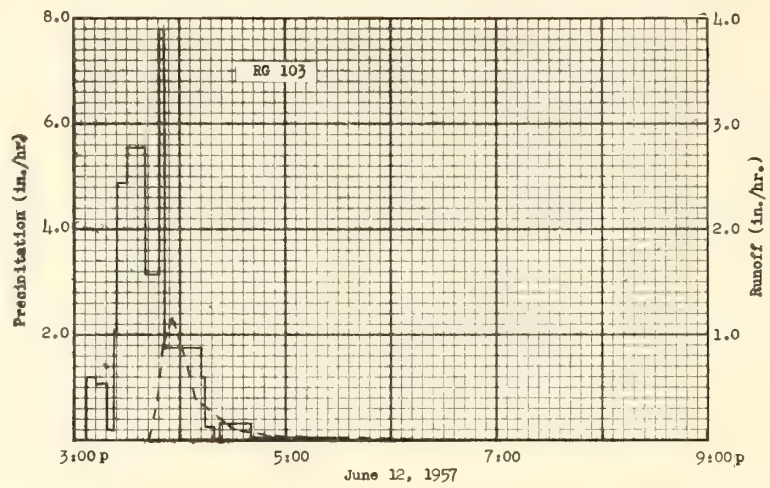
Watershed conditions: Uneven  
age stand of hardwoods; good  
woodland management; no grazing.  
Trees up to 80'. Shrubs 36".  
Herbs 18". Litter 1/2". No  
frost. Snow cover 5" on Jan. 20.



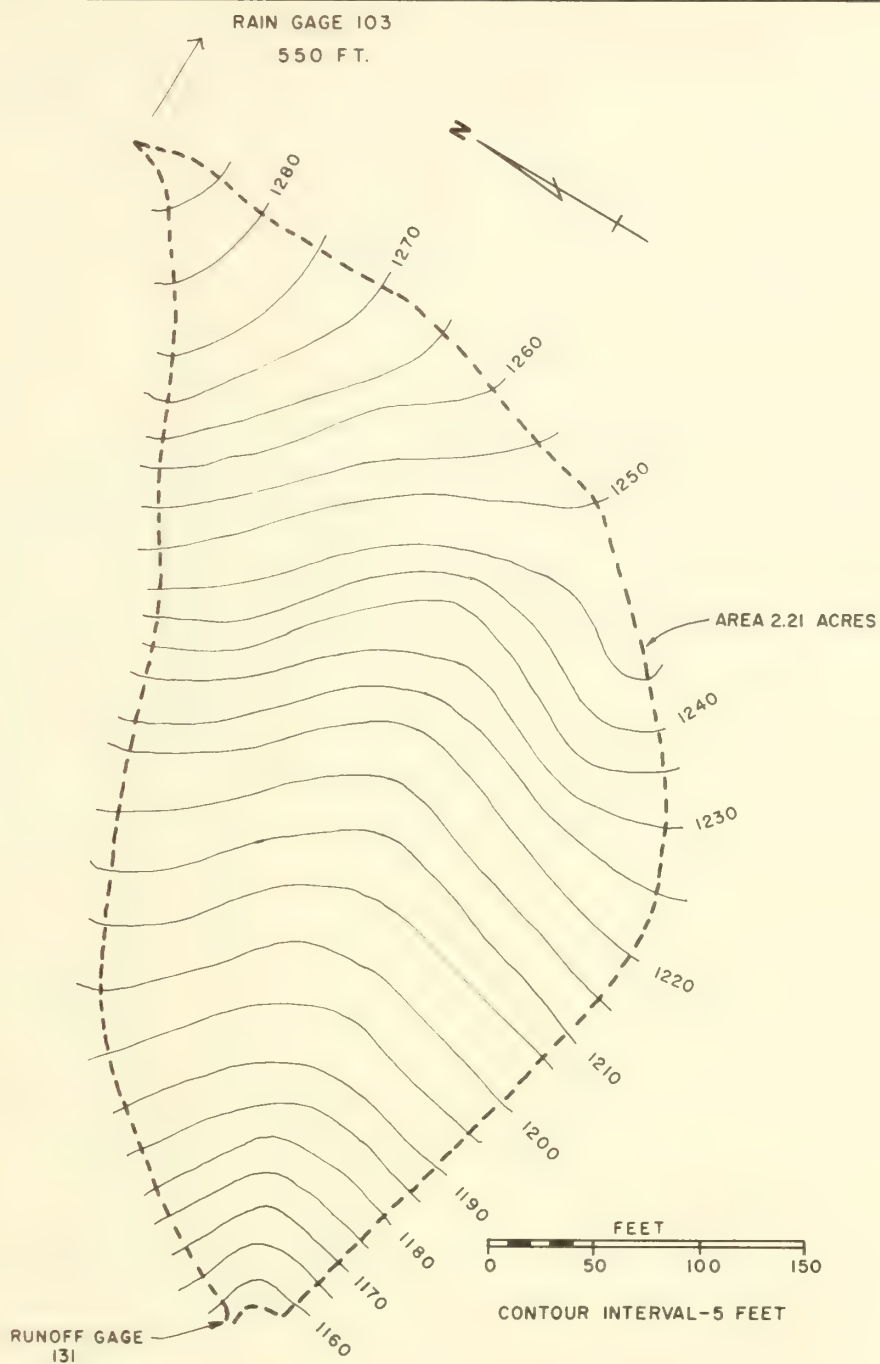
COSHOCTON, OHIO WATERSHED 131

Notes:

- 1/ Snow
- 2/ Rain and Snow



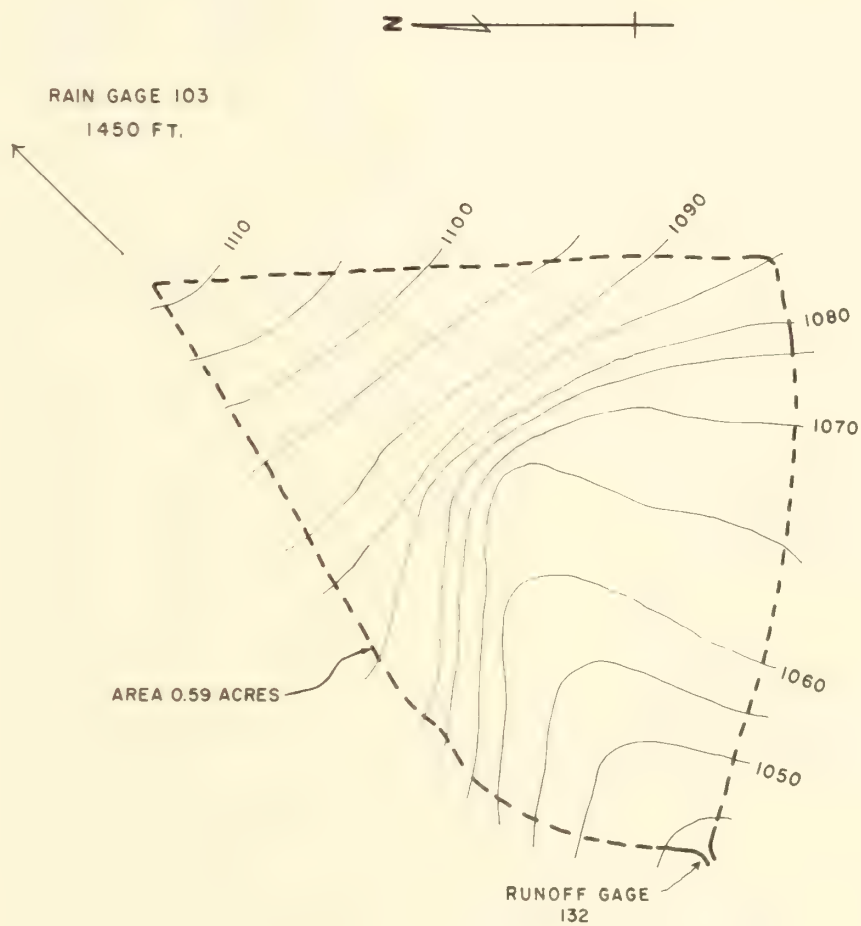
COSHOCOTON, OHIO WATERSHED 131



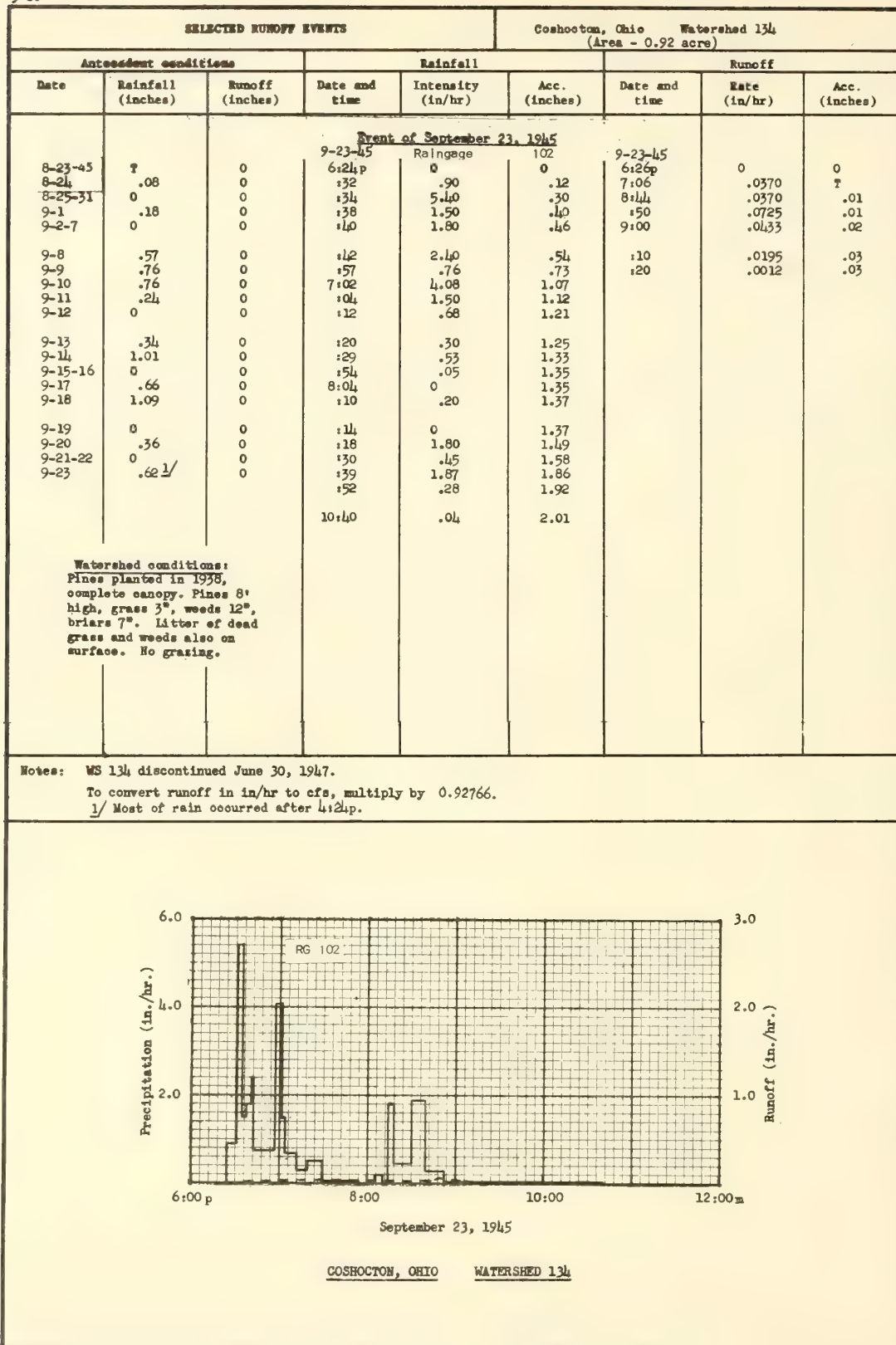
COSHOCTON, OHIO  
WATERSHED 131

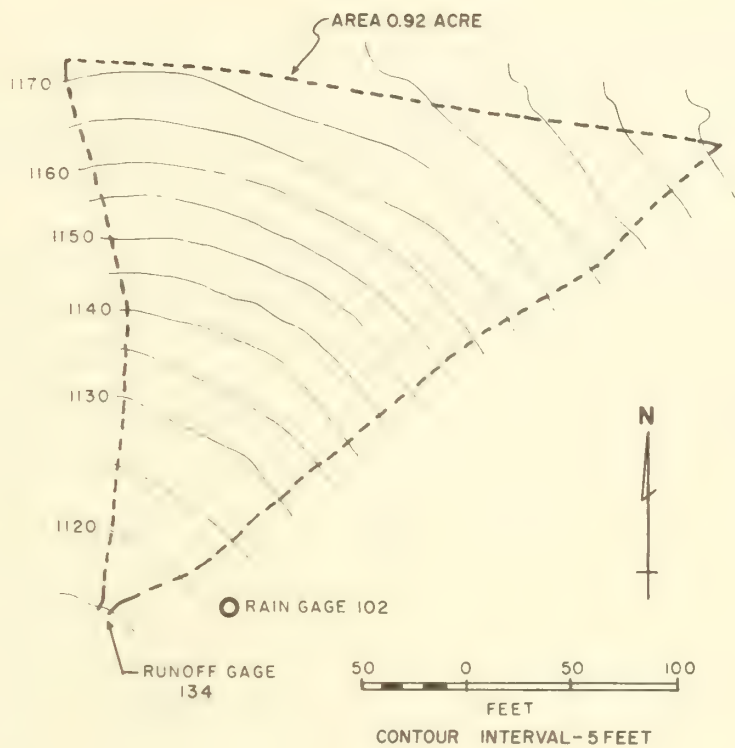


MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 132 (Area - 0.59 acre)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	1.47 0	5.22 .49	3.80 0	3.85 0	6.87 0	4.61 0	6.44 T	3.86 0	1.34 0	1.09 0	1.45 0	3.36 0	43.36 .49			
1957 P Q	1.58 0	1.31 0	1.79 0	4.91 0	4.07 0	10.80 1.37	3.53 0	1.99 .02	3.90 0	1.58 0	2.74 0	4.07 .05	42.27 1.44			
1958 P Q	1.49 0	.74 0	.94 0	3.53 .01	3.01 .10	4.10 0	9.16 .10	2.86 0	3.18 0	.29 0	2.09 0	.80 0	32.19 .21			
1959 P Q	5.87 2.00	2.78 .85	2.44 .04	4.24 1.01	2.72 0	4.35 T	4.45 0	2.28 .01	2.89 0	4.87 T	2.62 0	1.94 .07	41.45 3.98			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshooton, Ohio Watershed 132								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	e 2.00		nr		nr		nr		nr	6-12	e .82	6-12	e .82	6-12	e .82
1958	5-4	.03	5-4	.02	5-4	.04	5-4	.10	5-4	.10	5-4	.10	5-4	.10	5-4	.10
1959	1-21	e .30		nr		nr		nr		nr	1-21	e 2.00	1-21	e 2.00	1-21	e 2.00
Notes: Quality of records: monthly P and Q, good; annual maximum discharges and volumes, fair. Cover 1956-1959, 100% uneven age hardwoods.																
SELECTED RUNOFF EVENTS																
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)						
	</															



COSHOCTON, OHIO  
WATERSHED 132





COSHOCTON, OHIO  
WATERSHED 134



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 123 (Area - 1.37 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956	P Q	1.53 0	5.64 1.13	4.17 .04	4.18 0	6.85 .05	5.28 .37	6.36 .03	4.19 T	1.70 0	1.21 0	1.61 0	3.11 0	45.83 1.62		
1957	P Q	1.80 .32	1.49 0	1.80 0	5.11 1.12	4.33 0	10.54 3.07	3.41 .01	1.83 T	3.91 .04	1.75 0	2.98 0	4.57 .67	43.52 5.23		
1958	P Q	1.54 .22	.80 .23	1.02 0	3.87 0	3.29 .37	4.29 0	9.39 .53	2.84 .02	3.09 .02	.39 0	2.21 0	.90 0	33.63 1.39		
1959	P Q	5.96 2.33	3.33 .91	2.59 0	4.59 .42	3.00 T	4.47 .01	4.13 T	2.26 .02	2.97 T	5.64 T	3.06 .01	2.37 .40	44.37 4.10		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshooton, Ohio Watershed 123								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	5.97	6-12	1.37	6-12	1.48	6-28	1.51	6-28	1.51	6-12	1.56	6-12	1.56	6-12	1.56
1958	7-30	.32	5-4	.15	5-4	.23	5-4	.37	5-4	.37	7-30	.50	7-30	.50	7-22	.51
1959	1-21	.55	1-21	.45	1-21	.67	1-21	1.12	1-21	1.84	1-21	2.33	1-21	2.33	1-21	2.33
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, 2nd year meadow; 1957, corn; 1958, wheat; 1959, 1st year meadow; conservation practice.																
SELECTED RUNOFF EVENTS								Coshooton, Ohio Watershed 123								
Antecedent conditions			Rainfall					Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Rainage	Y-103	9-23-45										
8-24	.07	0	5:28p	0	0	6:52p	0	0								
8-25-31	0	0	:30	3.00	.10	7:16	.332	.02								
9-1	.15	0	:40	.78	.23	:33	.133	.08								
9-2-7	0	0	:50	0	.23	:40	.0854	.10								
9-8	.55	0	:52	2.40	.31	:50	.0483	.11								
9-9	.66	0	0:24	0	.31	8:02	.0216	.12								
9-10	.65	0	:30	.20	.33	:14	.0145	.12								
9-11	.14	0	:34	1.20	.41	:29	.0654	.13								
9-12	0	0	:41	1.71	.61	:30	.108	.13								
9-13	.30	0	:43	3.00	.71	:46	.377	.20								
9-14	1.21	0	:52	.73	.82	9:00	.263	.28								
9-15-16	0	0	:54	1.20	.86	:12	.133	.31								
9-17	.59	0	:56	.60	.88	:20	.0854	.33								
9-18	1.08	0	7:00	2.55	1.05	:35	.0183	.35								
9-19	0	0	:03	3.40	1.22	10:00	.0216	.36								
9-20	.43	0	:08	.48	1.26	11:45	0	.37								
9-21-22	0	0	:16	.52	1.33											
9-23	.20 1/	0	:22	.20	1.35											
			:30	.45	1.41											
			:58	.06	1.44											
			8:08	0	1.44											
			:10	.30	1.45											
			:14	0	1.45											
			:20	1.20	1.57											
			:26	.60	1.63											
			:30	.40	1.67											
			:34	2.40	1.75											
			:40	1.90	1.94											
			:50	.24	1.98											
Notes:																
To convert runoff in in/hr to cfs, multiply by 1.3614.																
1/ Most of rain occurred after 3:28p.																

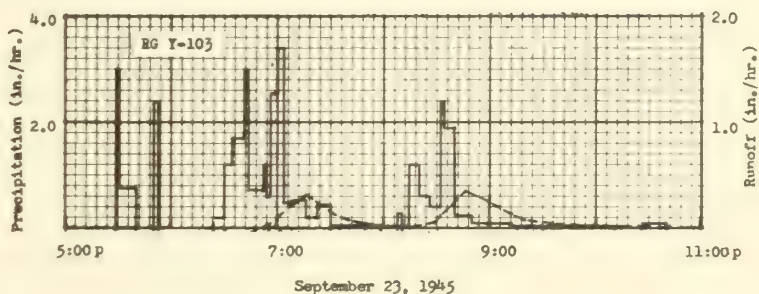
Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station

SELECTED RUNOFF EVENTS						Coshooton, Ohio Watershed 123		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 23, 1945 - continued								
			9:12	.11	2.02			
			10:10	.04	2.06			
			1:26	0	2.06			
			1:40	.09	2.08			
Event of June 12, 1957								
5-13-57	0	0	6-12-57	Raingage	Y-103	6-12-57		
5-14	1.33	0	3:10p	0	0	3:30p	0	0
5-15	.06	0	1:2	3.60	.12	1:40	.06	T
5-16-17	0	0	1:18	1.40	.26	1:45	.20	.02
			1:30	2.25	.71	1:50	.60	.05
5-18	.16	0	1:38	3.60	1.19	1:55	3.20	.21
5-19	.24	0	1:42	4.05	1.46	4:00	5.97	.59
5-20	.20	0	1:47	6.72	2.02	4:05	3.20	.97
5-21	0	0	1:50	2.00	2.12	4:10	1.20	1.16
5-22	.53	0	1:54	4.20	2.40	4:15	.50	1.23
5-23-25	0	0	1:57	6.60	2.73	4:30	.303	1.32
5-26	.18	0	4:00	4.00	2.93	4:50	.192	1.40
5-27-31	0	0	1:10	.12	2.95	5:10	.0999	1.45
6-1	.11	0	1:26	.34	3.04	5:30	.0537	1.47
6-2-7	0	0	5:10	.16	3.13	6:10	.0216	1.50
6-8	.99	0	9:10	.01	3.18	8:00	0	1.51
6-9-10	0	0						
6-11	.30	0						
6-12	0	0						
Watershed conditions: in corn, wheat, meadow, meadow rotation (conservation practice) since 1941. Corn planted May 3, 1957. Corn plants 20" high, weeds 12" high.								
Notes: To convert runoff in in/hr to cfs, multiply by 1.3614								

SELECTED RUNOFF EVENTS						Coshooton, Ohio Watershed 123		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 28, 1957								
5-28-57	0	0	6-28-57	Raingage	Y-103	6-28-57		
5-29-31	0	0	1:07p	0	0	4:55p	0	0
6-1	.11	0	:11	3.30	.22	5:12	.0383	.01
6-2-7	0	0	:40	.04	.24	:33	.116	.03
6-8	.99	0	:46	1.40	.38	:42	.214	.06
6-9-10	0	0	2:02	0	.38	:52	.276	.10
6-11	.30	0	:08	.60	.44	:57	.290	.12
6-12	3.18	1.51	:14	0	.44	6:06	.426	.18
6-13	.48	.06	:35	.06	.46	:10	.410	.20
6-14	.06	0	:52	.28	.54	:14	.496	.23
6-15	0	0	:58	.50	.59	:18	.722	.27
6-16	.16	0	3:42	.04	.62	:30	.678	.41
6-17-18	0	0	4:24	.13	.71	:35	.555	.47
6-19	.02	0	:30	1.70	.88	:40	.678	.52
6-20-22	0	0	5:30	.51	1.19	:43	.818	.56
6-23	.10	0	6:05	.57	1.52	:46	1.03	.61
6-24	2.09	0	:16	.82	1.67	:48	1.40	.65
6-25-27	0	0	:34	.70	1.88	:52	1.91	.76
6-28	.17 2/	0	:50	1.72	2.34	:56	1.68	.88
			7:00	1.08	2.52	7:03	.919	1.02
			:40	.37	2.77	:08	.700	1.09
			:44	0	2.77	:22	.377	1.21
			8:00	.11	2.80	:33	.263	1.27
			:10	.06	2.81	8:02	.161	1.38
						:07	.124	1.39
						:37	.0717	1.44
						9:32	.0294	1.48
						10:47	.0088	1.51
						11:47	0	1.51
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Raingage	Y-103	1-21-59		
12-23	T	0	12:01a	0	0	1:46a	0	0
12-24	.06 1/	0	1:04	.06	.06	2:10	.0383	.01
12-25-31	0	0	:53	.16	.19	:40	.0854	.04
1-1-59	.68	0	:58	0	.19	3:10	.108	.09
1-2-3	0	0	2:00	.90	.22	:50	.116	.16
1-4	.06 1/	0	:02	0	.22	4:14	.108	.21
1-5-8	0	0	:30	.26	.34	:28	.124	.23
1-9-10	T 1/	0	3:00	.06	.37	:36	.214	.26
1-11-13	0	0	:30	.14	.44	:44	.317	.29
1-14	.29	0	:50	0	.44	:54	.534	.37
1-15	.85 2/	0	4:17	.13	.50	5:06	.553	.47
1-16-19	.36 1/	0	:30	.23	.56	:30	.377	.66
1-20	.47	0	:39	1.47	.78	:46	.317	.75
			:47	.60	.86	6:20	.171	.89
			5:05	.23	.73	:50	.0999	.96
			:14	.53	1.01	8:00	.0717	1.05
			:58	.22	1.17	:30	.0654	1.08
			7:20	.01	1.19	:50	.0926	1.11
			:30	.24	1.23	9:04	.115	1.13
Notes:								
1/ Snow			To convert runoff in in/hr to cfs, multiply by 1.3814					
2/ Rain and Snow			3/ Rain ended about 7:30a.					

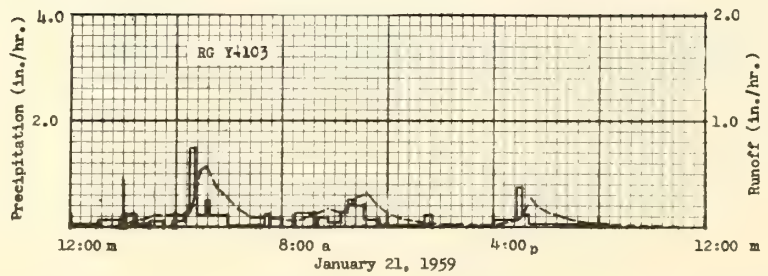
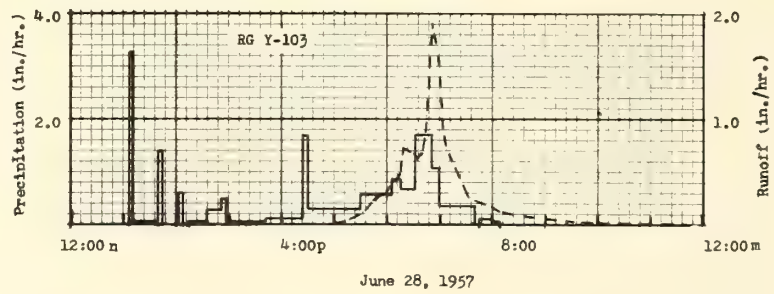
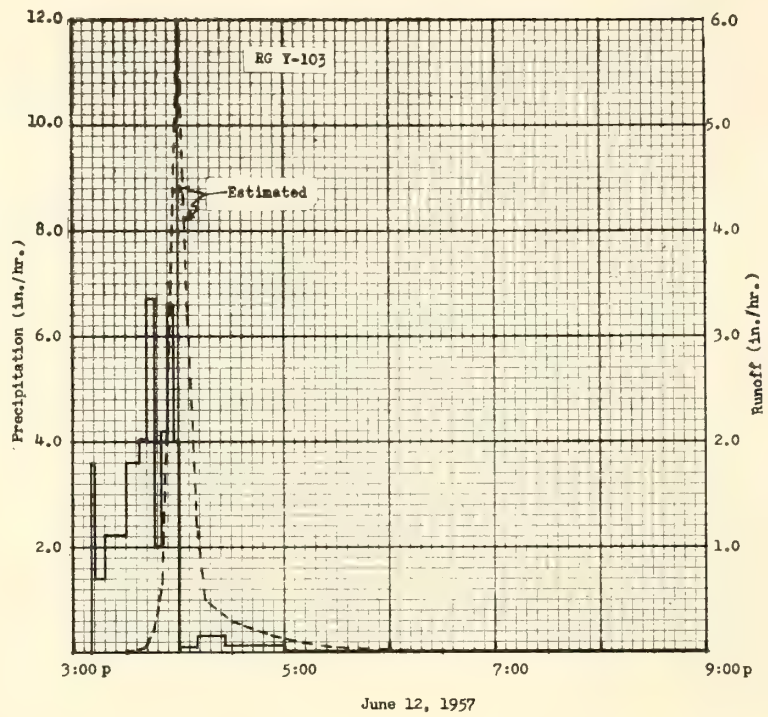
SELECTED RUNOFF EVENTS					Coshocton, Ohio Watershed 123			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959 - Continued								
			8:28a	0	1.23	9:46a	.171	1.24
			9:15	.27	1.44	10:10	.142	1.30
			1:20	0	1.44	1:22	.151	1.33
			1:44	.20	1.52	1:40	.263	1.40
			10:14	.10	1.57	11:12	.317	1.55
			1:27	.28	1.63	1:34	.214	1.65
			1:44	.56	1.79	12:00m	.133	1.73
			11:06	.41	1.94	1:30p	.0717	1.78
			1:40	.16	2.03	1:20	.0337	1.82
			1:24p	.02	2.07	2:30	.0294	1.86
			1:40	.22	2.13	4:00	.0179	1.89
			3:30	0	2.13	4:40	.0483	1.91
			4:00	.04	2.15	5:00	.0854	1.93
			1:52	.15	2.28	1:24	.263	2.01
			5:03	.76	2.42	1:40	.203	2.08
			1:22	.25	2.50	6:08	.133	2.16
			7:40	.07	2.66	1:40	.0854	2.21
						7:30	.0483	2.27
						8:30	.0216	2.30
						10:10	.0044	2.32
						11:00	0	2.33

Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1941. First year meadow in 1959. Vegetation in dormant state. Depth of frost penetration 1". Snow cover 5" on January 20.

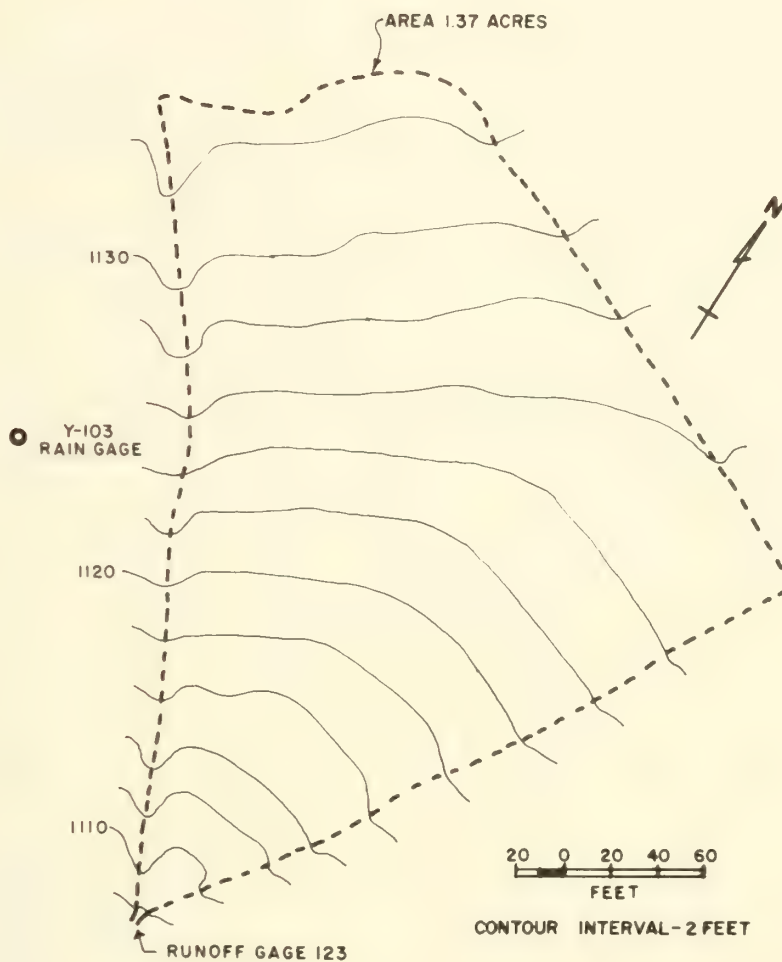


COSHOCTON, OHIO WATERSHED 123





COSHOCTON, OHIO WATERSHED 123



COSHOCTON, OHIO  
WATERSHED 123

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 115 (Area - 1.61 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.53	5.64	4.17	4.18	6.85	5.28	6.36	4.19	1.70	1.21	1.61	3.11	45.83		
	Q	0	.41	.32	0	.01	.08	.03	0	0	0	0	0	.85		
1957	P	1.80	1.49	1.80	5.11	4.33	10.54	3.41	1.83	3.91	1.75	2.98	4.57	43.52		
	Q	.02	0	0	.26	.03	2.18	.01	0	.02	0	0	.41	2.93		
1958	P	1.54	.80	1.02	3.87	3.29	4.29	9.39	2.84	3.09	.39	2.21	.90	33.63		
	Q	.48	.10	0	0	.12	0	.35	.01	0	0	0	0	1.06		
1959	P	5.96	3.33	2.59	4.59	3.00	4.47	4.13	2.26	2.97	5.64	3.06	2.37	44.37		
	Q	1.50	.25	T	.12	T	0	T	.01	0	T	0	.04	1.92		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 115								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	4.12	6-12	0.99	6-12	1.04	6-28	1.05	6-12	1.09	6-12	1.09	6-12	1.09	6-12	1.09
1958	7-30	.39	7-30	.11	7-31	.11	1-24	.22	1-24	.28	7-30	.33	7-30	.33	1-21	.48
1959	1-21	.32	1-21	.27	1-21	.43	1-21	.86	1-21	1.25	1-21	1.50	1-21	1.50	1-21	1.50
Notes: Quality of records: monthly P, good; Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, 2nd year meadow; 1957, corn; 1958, wheat; 1959, 1st year meadow, prevailing practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 115								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Raingage	Y-103	9-23-45										
8-24	.07	0	5:28p	0	0	5:28p	0	0								
8-25-31	0	0	:30	3.00	.10	:34	.0003	T								
9-1	.15	0	:40	.78	.23	:39	.0457	T								
9-2-7	0	0	:50	0	.23	:50	.0152	.01								
9-8	.55	T	:52	2.40	.31	:56	.0986	.01								
9-9	.66	.01	6:24	0	.31	6:04	.0250	.02								
9-10	.65	.02	:30	.20	.33	:35	.0038	.02								
9-11	.11	T	:34	1.20	.41	:39	.145	.03								
9-12	0	0	:41	1.71	.61	:48	.577	.09								
9-13	.30	0	:43	3.00	.71	:59	.334	.17								
9-14	1.21	.30	:52	.73	.82	7:07	1.63	.28								
9-15-16	0	0	:54	1.20	.86	:13	.825	.41								
9-17	.57	T	:56	.60	.88	:23	.282	.49								
9-18	1.08	.13	7:00	2.55	1.05	:31	.315	.52								
9-19	0	0	:03	3.40	1.22	:43	.0788	.54								
9-20	.43	.07	:08	.48	1.26	:53	.0411	.55								
9-21-22	0	0	:16	.52	1.33	8:13	.0184	.56								
9-23	.201/	.85	:22	.20	1.35	:24	.0850	.57								
			:30	.45	1.41	:32	.224	.60								
			:58	.06	1.44	:45	.850	.69								
			8:08	0	1.44	:54	.295	.78								
			:10	.30	1.45	9:02	.125	.80								
			:14	0	1.45	:13	.0506	.82								
			:20	1.20	1.57	:23	.0326	.82								
			:26	.60	1.63	:53	.0123	.83								
			:32	.40	1.67	12:00m	.0003	.85								
			:34	2.40	1.75											
			:40	1.90	1.94											
			:50	.24	1.98											
Notes: To convert runoff in in/hr to cfs, multiply by 1.6234. 1/ Most of rain occurred after 3:28p.																

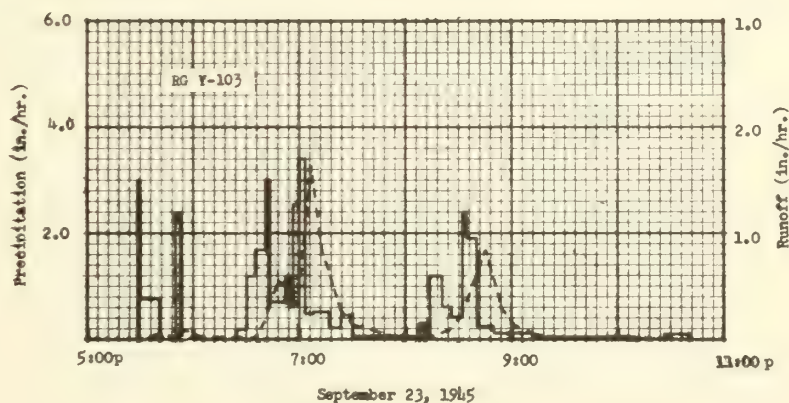
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 115		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of September 23, 1945 - Continued</u>								
			9:12p	0.11	2.02			
			10:10	.04	2.06			
			:26	0	2.06			
			:40	.09	2.08			
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing prac- tice) since 1941. Corn in 1945. Corn plants 108" high, weeds 48", grass 36" high.								
<u>Event of June 12, 1957</u>								
5-13-57	0	0	6-12-57	Raingage	Y-103	6-12-57		
5-14	1.33	.03	3:10p	0	0	3:34p	0	0
5-15	.06	0	:12	3.60	.12	:44	.270	.01
5-16-17	0	0	:18	1.40	.26	:48	1.19	.05
			:30	2.25	.71	:59	4.12	.50
5-18	.16	0	:38	3.60	1.19	4:01	3.67	.63
5-19	.24	0	:42	4.05	1.46	:13	.392	.91
5-20	.20	0	:47	6.72	2.02	:30	.129	.97
5-21	0	0	:50	2.00	2.12	:48	.0986	1.00
5-22	.53	0	:54	4.20	2.40	5:06	.0411	1.02
5-23-25	0	0	:57	6.60	2.73	6:00	.0123	1.04
5-26	.18	0	4:00	4.00	2.93	9:08	0	1.05
5-27-31	0	0	:10	.12	2.95			
6-1	.14	0	:26	.34	3.04			
6-2-7	0	0	5:00	.16	3.13			
6-8	.99	0	9:00	.01	3.18			
6-9-10	0	0						
6-11	.30	0						
6-12	0	0						
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing prac- tice) since 1941. Corn planted May 3, 1957. Corn plants 18" high, weeds 10" high.								
Notes:								



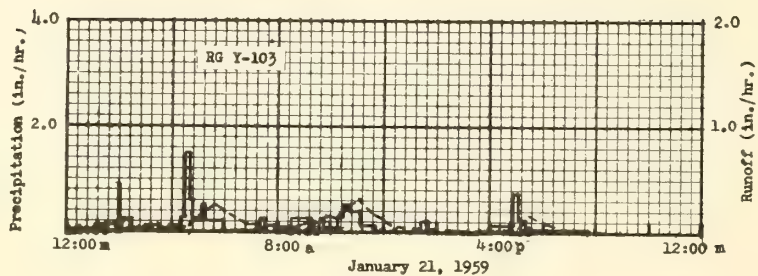
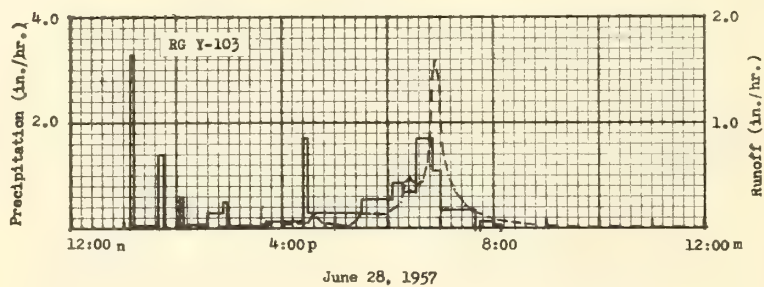
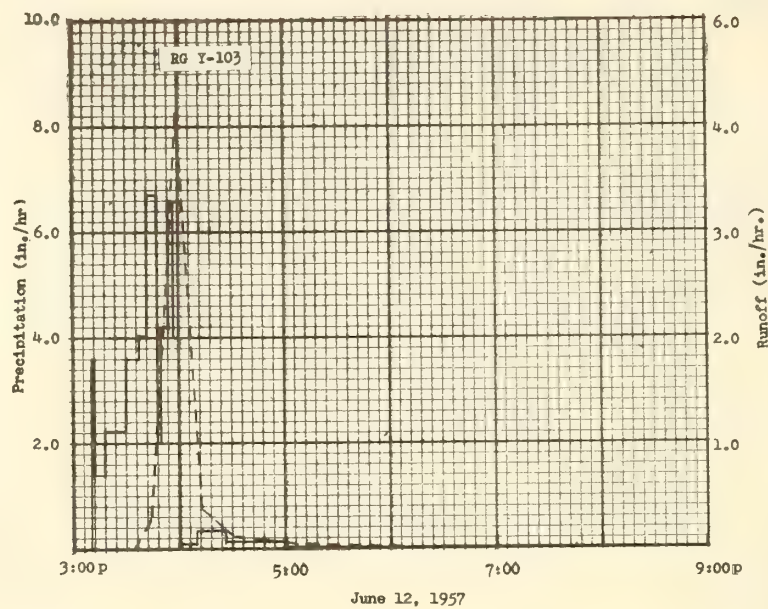
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 115		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage	Y-103	6-28-57		
6-1	.14	0	1:07p	0	0	1:40p	0	0
6-2-7	0	0	:11	3.30	.22	4:30	.0610	.01
6-8	.99	0	:40	.04	.24	:36	.121	.02
6-9-10	0	0	:46	1.40	.38	:46	.0610	.03
6-11	.30	0	2:02	0	.38	5:15	.0250	.05
6-12	3.18	1.05	:08	.60	.44	:25	.0727	.06
6-13	.48	.04	:14	0	.44	:40	.137	.08
6-14	.06	0	:35	.06	.46	:58	.137	.12
6-15	0	0	:52	.28	.54	6:15	.258	.18
6-16	.16	0	:58	.50	.59	:20	.439	.21
6-17-18	0	0	3:42	.04	.62	:25	.471	.25
6-19	.02	0	4:24	.13	.71	:35	.407	.32
6-20-22	0	0	:30	1.70	.88	:40	.439	.36
6-23	.10	0	5:30	.31	1.19	:45	.577	.40
6-24	2.09	.02	6:05	.57	1.52	:48	.782	.43
6-25-27	0	0	:16	.82	1.67	:52	1.49	.51
6-28	.17 2/	0	:34	.70	1.88	:54	1.59	.56
			:50	1.72	2.34	:58	1.36	.66
			7:00	1.08	2.52	7:00	1.10	.70
			:40	.37	2.77	:04	.696	.76
			:44	0	2.77	:09	.505	.81
			8:00	.11	2.80	:15	.377	.85
			:10	.06	2.81	:35	.172	.94
						8:01	.0986	1.00
						:15	.0610	1.02
						:30	.0411	1.03
						9:00	.0184	1.05
						12:00m	.0003	1.06
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Raingage	Y-103	1-21-59		
12-23	T	0	12:01a	0	0	12:54a	0	0
12-24	.06 1/	0	1:04	.06	.06	4:00	.0326	.05
12-25-31	0	0	:53	.16	.19	:38	.0610	.08
1-1-59	.68	0	:58	0	.19	:48	.106	.09
1-2-3	0	0	2:00	.90	.22	5:00	.154	.12
1-4	.06 1/	0	:02	0	.22	:38	.246	.26
1-5-8	0	0	:30	.26	.34	6:00	.202	.34
1-9-10	T 1/	0	3:00	.06	.37	:50	.0850	.45
1-11-13	0	0	:30	.14	.44	8:00	.0610	.53
1-14	.29	0	:50	0	.44	:30	.0506	.56
1-15	.85 2/	0	4:17	.13	.50	9:00	.0850	.59
1-16-19	.36 1/	0	:30	.28	.56	:50	.163	.71
1-20	.47	0	:39	1.47	.78	10:12	.137	.76
			:47	.60	.86	:28	.202	.80
			5:05	.23	.93	11:04	.321	.96
			:14	.53	1.01	:30	.202	1.08
			:58	.22	1.17	12:00m	.113	1.16
			7:20	.01	1.19	:14p	.0850	1.18
			:30	.24	1.23	:30	.0557	1.20
			8:28	0	1.23	4:00	.0075	1.28
			9:15	.27	1.44	5:06	.0610	1.30
			:20	0	1.44	:28	.163	1.35
			:44	.20	1.52	6:00	.0986	1.42
			10:14	.10	1.57	:46	.0411	1.47
Notes: 1/ Snow 2/ Rain ended about 7:30a.								
2/ Rain and Snow								

SELECTED RUNOFF EVENTS					Coshocton, Ohio Watershed 115			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Frost of January 21, 1959 - Continued</u>								
Watershed conditions: in corn, wheat, meadow, meadow rotation (prevailing practice) since 1941. First year meadow in 1959. Vegetation dormant. Frost penetration 1". Snow cover 5" on January 20.			10:27 a	0.28	1.63	7:18 p	0.0250	1.49
			1:44	.56	1.79	8:50	0	1.50
			11:06	.41	1.94			
			1:40	.16	2.03			
			1:24 p	.02	2.07			
			1:40	.22	2.13			
			3:30	0	2.13			
			4:00	.04	2.15			
			5:52	.15	2.28			
			5:03	.76	2.42			
			1:22	.25	2.50			
			7:40	.07	2.66			

Notes:

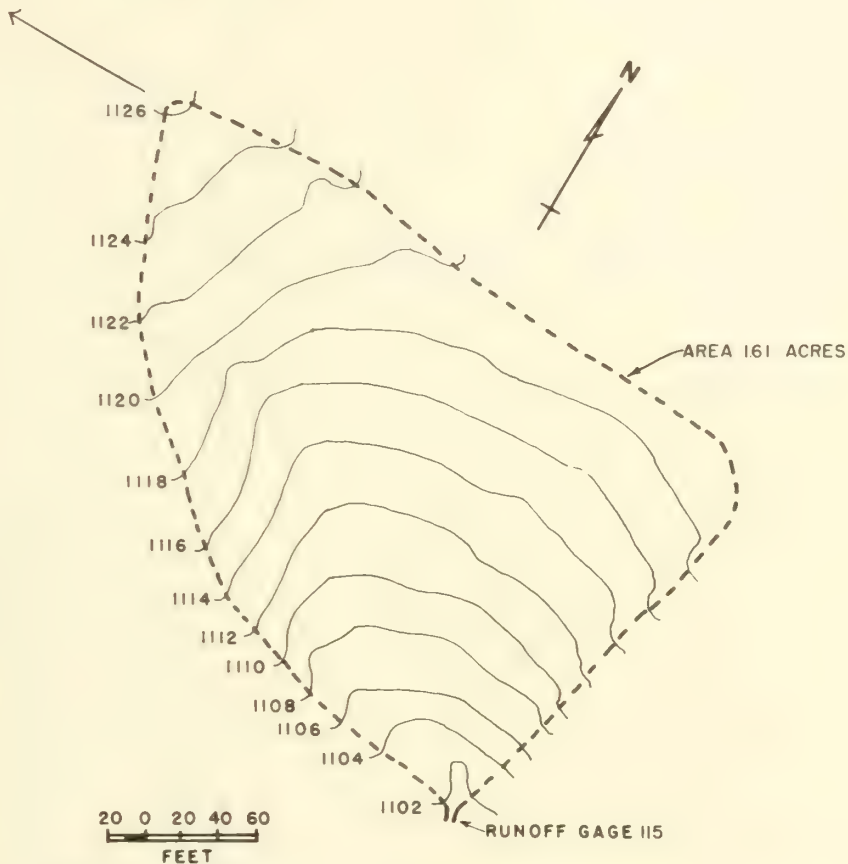


COSHOCTON, OHIO WATERSHED 115



COSHOCTON, OHIO WATERSHED 115

RAIN GAGE Y-103  
500 FT.



CONTOUR INTERVAL-2 FEET

COSHOCTON, OHIO  
WATERSHED 115

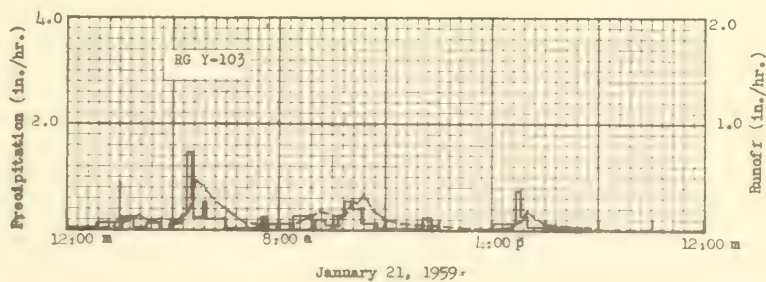
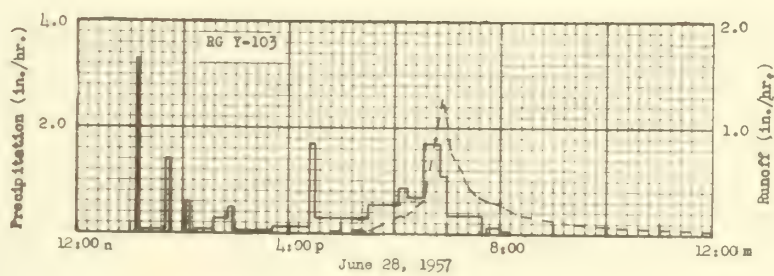
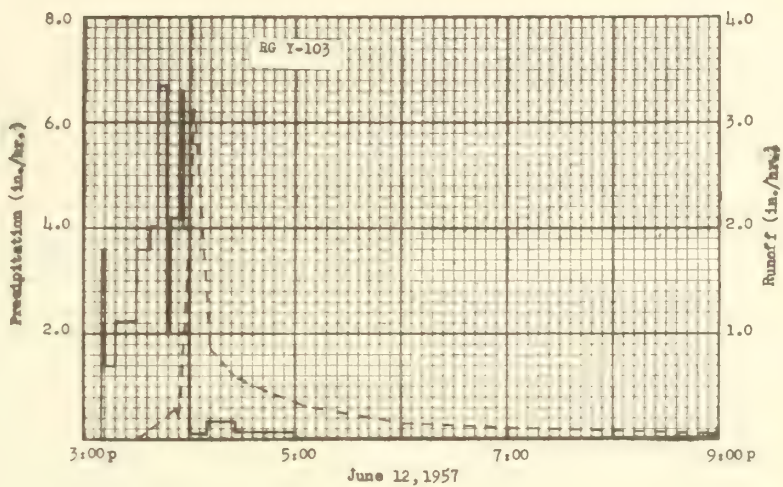


MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 127 (Area - 1.65 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	1.53 .36	5.64 1.03	4.17 .38	4.18 T	6.85 .13	5.28 .71	6.36 .24	4.19 .01	1.70 0	1.21 0	1.61 0	3.11 0	45.83 2.86			
1957 P Q	1.80 .01	1.49 0	1.80 0	5.11 1.90	4.33 0	10.54 3.51	3.41 T	1.83 0	3.91 T	1.75 0	2.98 0	4.57 1.43	43.52 6.85			
1958 P Q	1.54 .18	.80 .12	1.02 0	3.87 0	3.29 .41	4.29 0	9.39 .61	2.84 .07	3.09 .01	.39 0	2.21 0	.90 0	33.63 1.40			
1959 P Q	5.96 2.20	3.33 1.71	2.59 .02	4.59 .47	3.00 .01	4.47 .01	4.13 .01	2.26 .09	2.97 0	5.64 0	3.06 .22	2.37 .49	44.37 5.23			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 127								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	3.12	6-12	0.86	6-12	1.11	6-12	1.49	6-12	1.66	6-12	1.75	6-12	1.84	6-12	1.85
1958	7-30	.72	7-30	.18	5-4	.20	5-4	.31	5-4	.34	7-30	.52	7-30	.52	7-28	.56
1959	1-21	.47	1-21	.38	1-21	.56	1-21	.96	1-21	1.64	1-21	1.97	1-21	2.03	1-21	2.20
Notes: Quality of records: monthly P, excellent; Q, good; annual maximum discharges and volumes, good. Cover 1956, 2nd year meadow; 1957, corn; 1958, wheat; 1959, 1st year meadow; conservation practice plus mulch tillage.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 127								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)		Runoff (inches)	Date and time	Intensity (in/hr)		Acc. (inches)	Date and time	Rate (in/hr)		Acc. (inches)					
Event of June 12, 1957																
5-13-57	0.	0		6-12-57	Rainage	Y-103		6-12-57								
5-14	1.33	0		3:10p	0	0		3:31p	0	0						
5-15	.06	0		:12	3.60	.12		:52	.291	.03						
5-16-17	0	0		:18	1.40	.26		:54	.220	.04						
				:30	2.25	.71		4:00	1.98	.11						
5-18	.16	0		:38	3.60	1.19		:03	3.12	.24						
5-19	.24	0		:42	4.05	1.46		:12	.873	.50						
5-20	.20	0		:47	6.72	2.02		:26	.614	.66						
5-21	0	0		:50	2.00	2.12		:35	.502	.75						
5-22	.53	0		:54	4.20	2.40		5:06	.304	.96						
5-23-25	0	0		:57	6.60	2.73		6:01	.159	1.16						
5-26	.18	0		4:00	4.00	2.93		7:01	.109	1.29						
5-27-31	0	0		:10	.12	2.95		9:06	.0566	1.46						
6-1	.14	0		:26	.34	3.04										
6-2-7	0	0		5:00	.16	3.13										
6-8	.99	0		9:10	.01	3.18										
6-9-10	0	0														
6-11	.30	0														
6-12	0	0														
Watershed conditions: Corn planted May 2 using minimum tillage (plow-plant) practice. Corn plants 20", weeds 12" high. Land use is a 4-year rotation of corn, wheat, meadow, meadow since 1941, conservation practice with mulch tillage.																
Notes: To convert runoff in in/hr to cfs, multiply by 1.6637.																
Record began May 6, 1949.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station.

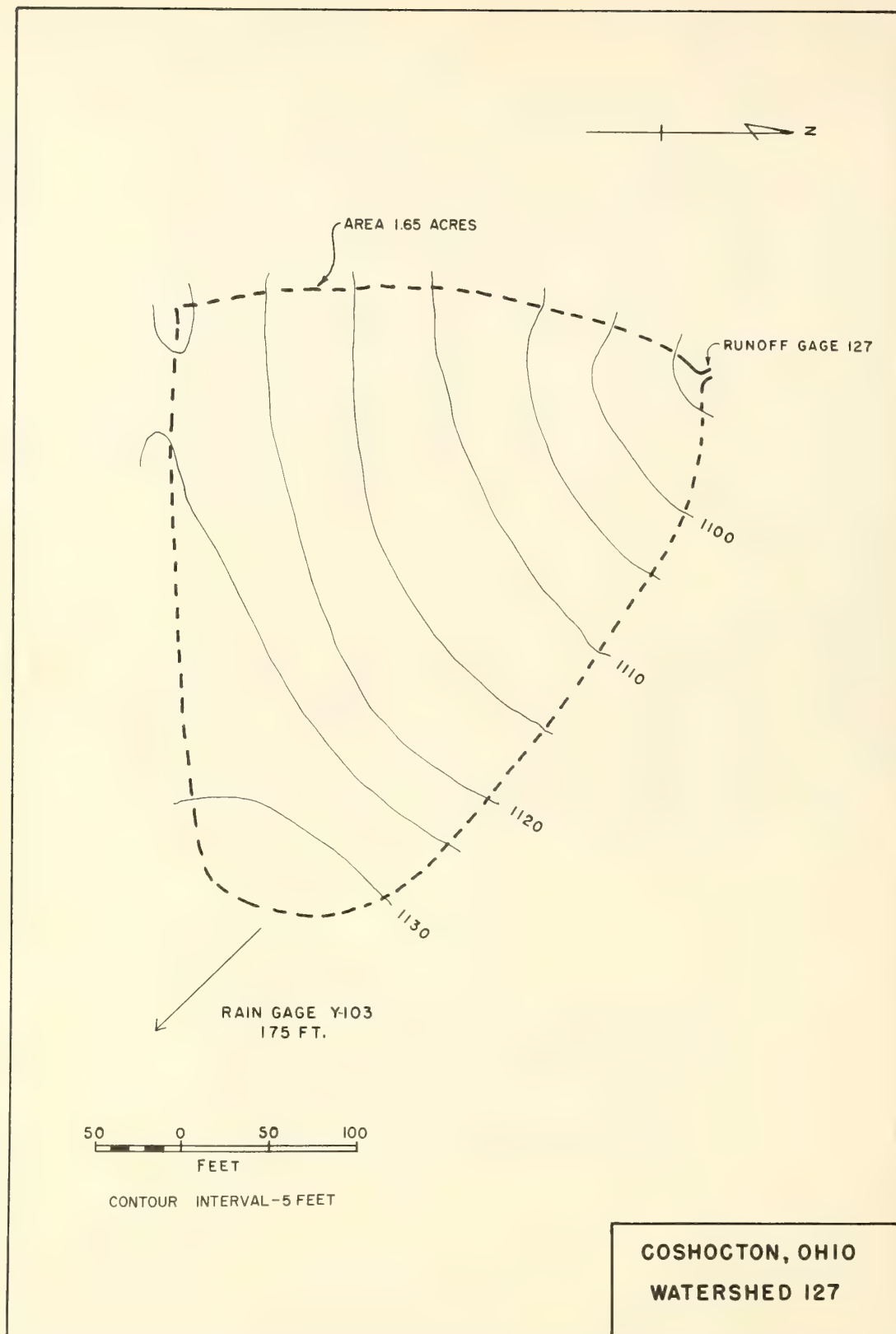
SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 127					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 28, 1957								
5-28-57	0	0	6-28-57	Rainage	Y-103	6-28-57		
5-29-57	0	0	1:07p	0	0	4:22p	0	0
6-1	.14	0	1:11	3.30	.22	5:36	.0566	.02
6-2-7	0	0	1:40	.04	.24	6:00	.141	.05
6-8	.99	0	1:46	1.40	.38	7:07	.178	.07
6-9-10	0	0	2:02	0	.38	1:12	.169	.08
6-11	.30	0	1:08	.60	.64	1:35	.317	.19
6-12	3.18	1.58	1:14	0	.64	1:54	1.27	.40
6-13	.48	.24	1:35	.06	.46	7:02	.801	.54
6-14	.06	.03	1:52	.28	.54	1:17	.574	.71
6-15	0	0	1:58	.50	.59	1:22	.485	.76
6-16	.16	0	3:42	.04	.62	1:32	.374	.83
6-17-18	0	0	4:24	.13	.71	1:47	.317	.91
6-19	.02	0	1:30	1.70	.88	8:02	.266	.99
6-20-22	0	0	5:30	.31	1.19	1:17	.199	1.04
6-23	.10	0	6:05	.57	1.52	9:17	.109	1.19
6-24	2.09	.11	1:16	.82	1.67	10:02	.0807	1.26
6-25	0	.01	1:34	.70	1.88	12:00m	.0367	1.37
6-26	0	0	1:50	1.72	2.34			
6-27	0	0	7:00	1.08	2.52			
6-28	.17 1/2		1:40	.37	2.77			
			1:44	0	2.77			
			8:00	.11	2.80			
			1:10	.06	2.81			
Watershed conditions: Corn planted May 2 using minimum tillage. Corn plants 38" high, weeds 24" high. Land use is a 4-year rotation of corn, wheat meadow, meadow since 1949, con- servation practice with mulch tillage.								
Notes: 1/ Rain ended about 7:30a.								

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 127		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-31-58	0	0	1-21-59	Raingage	Y-103	1-21-59		
1-1-59	.68	0	12:01a	0	0	12:01a	0	0
1-2-3	0	0	1:04	.06	.06	1:05	.0141	.01
1-4	.06 1/	0	:53	.16	.19	:35	.0284	.02
1-5-8	0	0	:58	0	.19	:51	.0462	.03
1-9-10	T 1/	0	2:00	.90	.22	2:15	.0939	.06
1-11-13	0	0	:02	0	.22	:45	.132	.12
1-14	.29	0	:30	.26	.34	3:05	.0939	.15
1-15	.85 2/	0	3:00	.06	.37	:35	.109	.20
1-16-19	.36 1/	0	:30	.14	.44	4:05	.0939	.25
1-20	.47	T	:50	0	.44	:35	.178	.31
Watershed conditions: Improved practice in 4-year rotation of corn, wheat, meadow, meadow. First year meadow in 1959. Vegetation in dormant state. Depth of frost penetration 1". Snow cover 5" on January 20.			4:17	.13	.50	:41	.291	.33
			:30	.28	.56	:51	.468	.39
			:39	1.47	.78	5:03	.435	.49
			:47	.60	.86	:31	.291	.67
			5:05	.23	.93	:51	.220	.75
			:14	.53	1.01	6:15	.141	.83
			:58	.22	1.17	:43	.0807	.88
			7:20	.01	1.19	7:25	.0572	.92
			:30	.24	1.23	:55	.0680	.95
			8:28	0	1.23	8:29	.0566	.98
			9:15	.27	1.44	9:05	.125	1.03
			:20	0	1.44	:31	.178	1.11
			:44	.20	1.52	:55	.169	1.17
			10:14	.10	1.57	10:15	.116	1.22
			:27	.28	1.63	:31	.178	1.26
			:44	.56	1.79	:45	.279	1.31
			11:06	.41	1.94	:55	.266	1.35
			:40	.16	2.03	11:11	.345	1.44
			1:24P	.02	2.07	:29	.190	1.52
			:40	.22	2.13	:57	.109	1.59
			3:30	0	2.13	12:13p	.0680	1.61
			4:00	.04	2.15	3:35	e .0210	1.70
			:52	.15	2.28	4:45	e .0367	1.73
			5:03	.76	2.42	5:07	.0939	1.75
			:22	.25	2.50	:21	.188	1.79
			7:40	.07	2.66	:35	.125	1.82
						:57	.0680	1.66
						7:55	e .0210	1.93
						12:00m	e .0027	1.97
Notes: 1/ Snow								
2/ Rain and Snow								



COSHOCOTON, OHIO WATERSHED 127

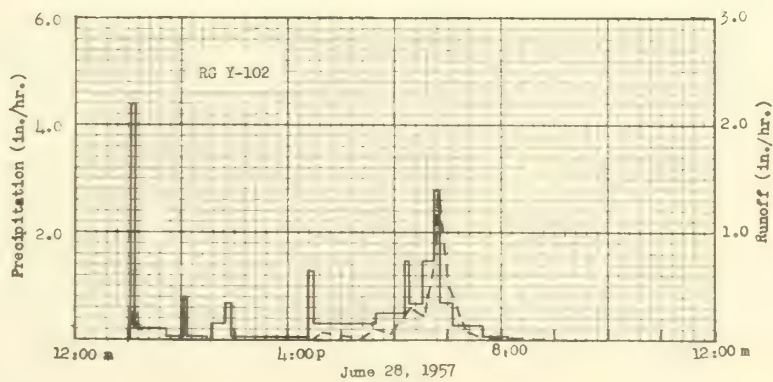
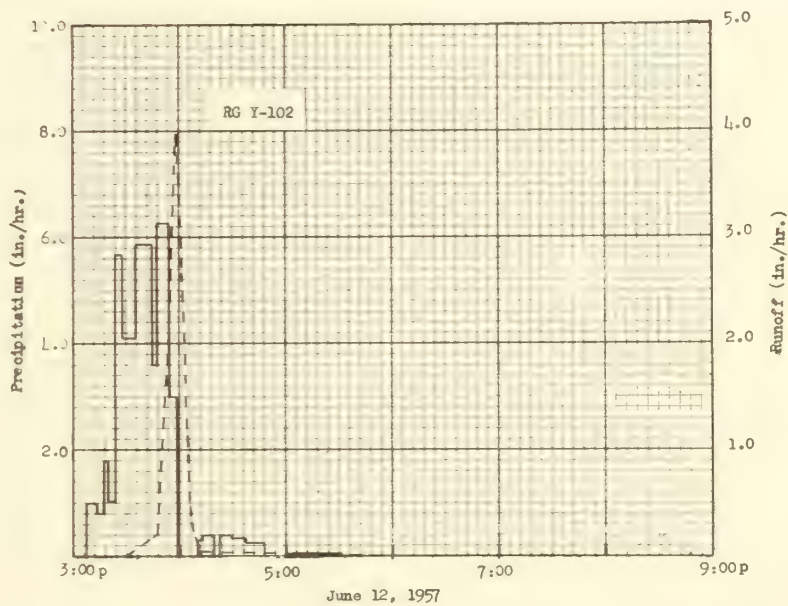
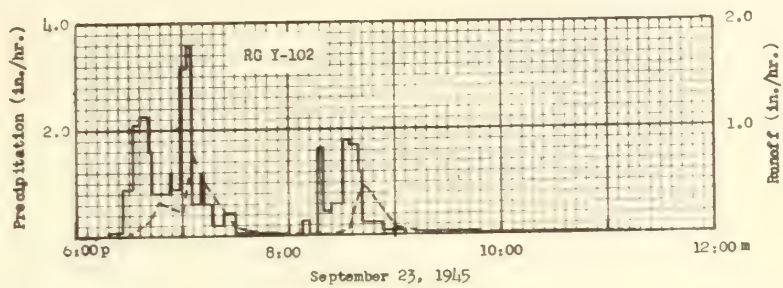




MONTHLY PRECIPITATION AND RUNOFF (Inches)									Coshocton, Ohio Watershed 109 (Area - 1.69 acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.52	5.48	3.65	4.05	7.08	5.07	6.60	4.02	1.55	1.17	1.59	2.97	44.75		
	Q	0	.01	0	0	0	.01	T	T	0	0	0	0	.02		
1957	P	1.58	1.32	1.89	4.91	4.29	10.50	3.50	1.83	3.90	1.52	2.71	4.24	42.19		
	Q	.01	0	0	.01	0	1.51	.09	.03	.08	0	0	0	1.73		
1958	P	1.40	.75	.96	3.72	3.13	4.25	9.35	2.77	3.23	.35	2.15	.90	32.96		
	Q	.02	.06	0	0	0	T	.10	0	0	0	0	0	.18		
1959	P	5.89	3.49	2.51	4.55	3.11	4.73	4.59	2.29	3.02	5.45	3.01	2.33	44.97		
	Q	1.00	.30	T	.01	T	.01	.01	.02	0	.01	0	0	1.36		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS									Coshocton, Ohio Watershed 109							
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	3.99	6-12	0.72	6-12	0.72	6-12	0.72	6-12	0.72	6-12	0.82	6-12	0.82	6-12	0.82
1958	7-31	.25	7-30	.04	7-30	.04	7-30	.04	7-30	.05	7-30	.09	7-30	.09	7-30	.10
1959	1-21	e.40		nr		nr		nr		nr		nr		nr		nr
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, 2nd year meadow; 1957, corn; 1958, wheat; 1959, 1st year meadow; conservation practice.																
SELECTED RUNOFF EVENTS									Coshocton, Ohio Watershed 109							
Antecedent conditions				Rainfall						Runoff						
Date	Rainfall (inches)		Runoff (inches)		Date and time	Intensity (in/hr)		Acc. (inches)		Date and time	Rate (in/hr)		Acc. (inches)			
Event of September 23, 1945																
8-23-45	T	0			9-23-45	Rainage		Y-102		9-23-45						
8-24	.06	0			6:18p	0		0		6:28p	0		0			
8-25-31	0	0			:26	.08		.01		:42	.164		.01			
9-1	.22	0			:32	.90		.10		:46	.336		.02			
9-2-7	0	0			:36	2.10		.24		7:00	.237		.08			
9-8	.54	0			:40	2.25		.39		:06	.780		.14			
9-9	.74	0			:43	1.60		.47		:12	.524		.20			
9-10	.67	0			:52	.80		.59		:30	.0915		.28			
9-11	.14	0			:54	1.20		.63		:40	.0316		.29			
9-12	0	0			:58	.90		.69		8:25	.0137		.29			
9-13	.31	0			7:02	3.15		.90		:34	.0663		.30			
9-14	1.20		.04		:04	3.60		1.02		:41	.424		.33			
9-15-16	0	0			:10	.60		1.08		:43	.456		.34			
9-17	.55	0			:12	1.20		1.12		9:00	.0786		.41			
9-18	.98	0			:16	.60		1.16		:17	.0204		.42			
9-19	0	0			:22	.20		1.18		11:15	0		.42			
9-20	.43	0			:30	.45		1.24								
9-21-22	0	0			:52	.05		1.26								
9-23	.69 1/2	0			8:08	0		1.26								
					:12	.30		1.28								
					:16	0		1.28								
					:20	1.65		1.39								
					:24	.45		1.42								
					:32	.60		1.50								
					:34	1.80		1.56								
					:40	1.70		1.73								
					:42	1.20		1.77								
					:52	.24		1.81								
					9:06	.09		1.83								
					:12	0		1.83								
					:46	.07		1.87								
					10:52	.03		1.90								
Notes: To convert runoff in in/hr to cfs, multiply by 1.7041. 1/ Most of rain occurred after 4:18p.																

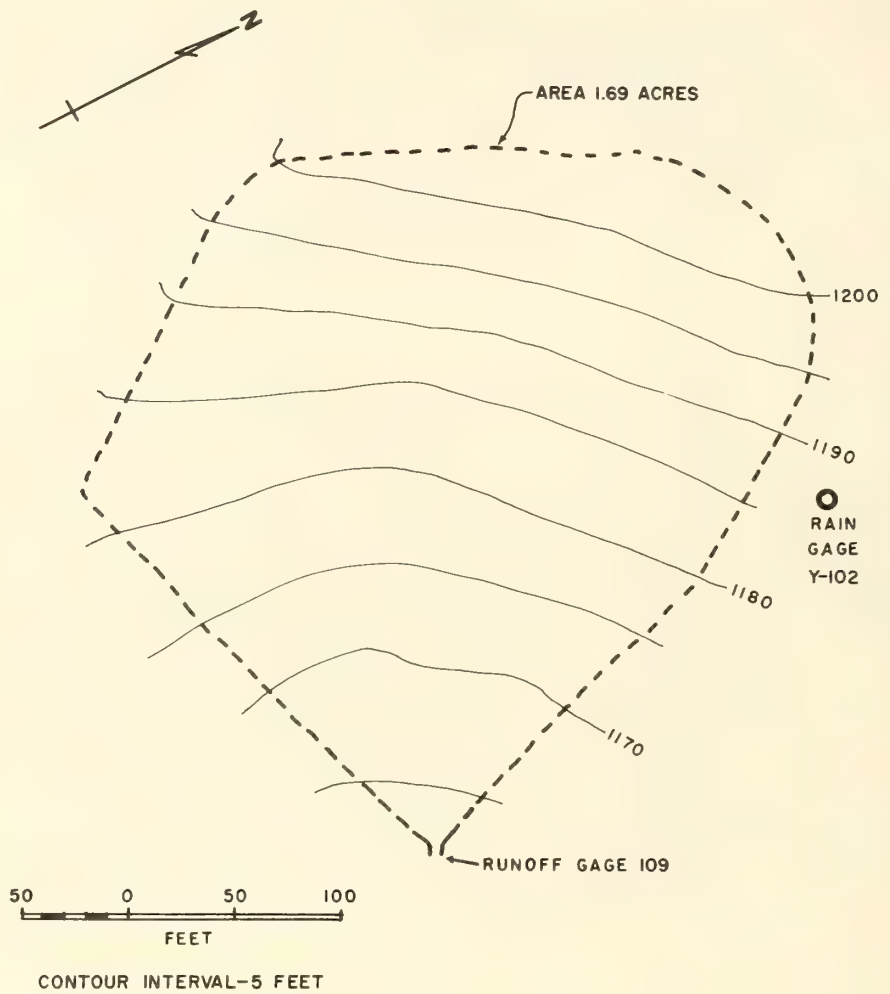
Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station

SELECTED RUNOFF EVENTS				Coshocton, Ohio Watershed 109				
Antecedent conditions			Rainfall			Runoff		
Event of June 12, 1957								
5-13-57	0	0	6-12-57	Rainage	Y-102	6-12-57		
5-14	1.28	0	3:08p	0	0	3:30p	0	0
5-15	.04	0	1:14	1.00	.10	1:48	.21 <sup>1</sup>	.01
5-16-17	0	0	1:17	.80	.14	1:54	2.24	.15
			1:20	1.80	.23	1:58	3.99	.37
5-18	.16	0	1:24	1.05	.30	4:02	2.67	.60
5-19	.20	0	1:28	5.70	.68	4:04	1.21	.66
5-20	.21	0	1:36	4.12	1.23	4:06	.52 <sup>1</sup>	.69
5-21	0	0	1:45	5.87	2.11	4:08	.259	.70
5-22	.51	0	1:48	3.60	2.29	4:11	.066	.71
5-23-25	0	0	1:55	6.26	3.02	6:00	0	.72
5-26	.17	0	1:59	3.00	3.22			
5-27-31	0	0	4:10	0	3.22			
6-1	.12	0	1:14	.30	3.24			
6-2-7	0	0	1:20	.40	3.28			
6-8	.95	0	1:22	0	3.28			
6-9-10	0	0	1:28	.40	3.32			
6-11	.29	0	1:38	.36	3.38			
6-12	0	0	1:48	.24	3.42			
			5:04	0	3.42			
			1:32	.04	3.44			
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1941. Corn planted May 3, 1957. Corn plants 20" high, weeds 12" high.								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Rainage	Y-102	6-28-57		
6-1	.12	0	1:05p	0	0	4:29p	0	0
6-2-7	0	0	1:08	4.40	.22	1:38	.0786	.01
6-8	.95	0	1:14	.20	.34	5:23	.0109	.02
6-9-10	0	0	2:02	.07	.36	1:38	.106	.04
6-11	.29	0	1:08	.80	.44	1:58	.0851	.07
6-12	3.44	.72	1:30	.05	.46	6:20	.309	.13
6-13	.42	.11	1:36	0	.46	1:35	.225	.20
6-14	.08	0	1:51	.32	.54	1:46	.675	.26
6-15	0	0	1:58	.69	.62	1:48	1.10	.29
6-16	.04	0	4:24	.06	.70	1:51	1.36	.35
6-17-18	0	0	1:30	1.30	.83	7:00	.599	.51
6-19	.02	0	5:40	.33	1.22	1:23	.0986	.60
6-20-22	0	0	6:12	.52	1.50	1:34	.0403	.61
6-23	.08	0	1:16	1.50	1.60	9:28	0	.63
6-24	2.11	.06	1:34	.67	1.80			
6-25-27	0	0	1:46	1.50	2.10			
6-28	.17 <sup>1/</sup>	0	1:52	2.80	2.38			
			7:07	.72	2.56			
			1:38	.27	2.70			
			8:10	.11	2.76			
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1941. Corn planted May 3, 1957. Corn plants 36" high, weeds 24" high.								
Notes: No tabulation for January 21, 1959 event due to faulty record.								
1/ Rain ended about 7:30a.								



COSHOCOTON, OHIO WATERSHED 109





COSHOCTON, OHIO  
WATERSHED 109

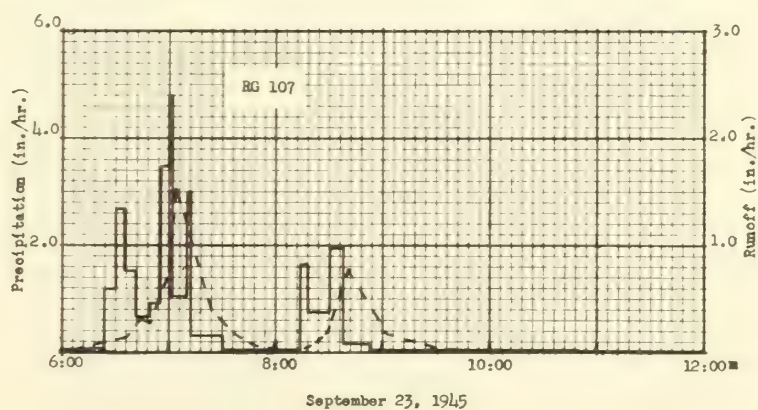
5-60		MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshocton, Ohio Watershed 103 (Area - 0.65 acre)							
Month Year		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.60	5.34	3.49	3.77	6.94	4.39	6.18	3.92	1.33	1.15	1.35	3.61	43.07		
	Q	0	.76	T	0	.01	.02	.24	0	0	0	0	0	1.03		
1957	P	1.59	1.34	1.80	4.96	3.96	10.55	3.71	2.23	3.72	1.53	2.72	3.99	42.10		
	Q	.11	0	0	.92	0	2.66	0	.01	0	0	0	.38	4.08		
1958	P	1.48	.58	.98	3.37	2.88	4.24	8.43	2.79	3.16	.30	1.81	.51	30.53		
	Q	.05	0	0	0	.10	0	.87	T	0	0	0	0	1.02		
1959	P	5.21	2.84	2.33	4.02	2.79	4.15	4.43	2.40	2.84	4.90	2.64	2.11	40.66		
	Q	2.17	.00	T	.31	0	0	0	.07	0	0	.05	.23	3.71		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 103								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	4.01	6-12	1.20	6-12	1.24	6-28	1.39	6-28	1.39	6-28	1.39	6-28	1.39	6-24	1.41
1958	7-31	.75	7-22	.19	7-22	.23	7-22	.27	7-31	.31	7-30	.34	7-30	.35	7-28	.35
1959	1-21	.60	1-21	.37	1-21	.52	1-21	.94	1-21	1.43	1-21	2.16	1-21	2.17	1-21	2.17
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, 1st year meadow; 1957, 2nd year meadow; 1958, corn; 1959, wheat; conservation practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 103								
Antecedent conditions				Rainfall					Runoff							
Date	Rainfall (inches)		Runoff (inches)	Date and time	Intensity (in/hr)		Acc. (inches)	Date and time	Rate (in/hr)		Acc. (inches)					
Event of September 23, 1945																
8-23-45	T	0	0	9-23-45	Raingage		107	9-23-45								
8-24	.06	0	0	6:00p	0		0	6:00p	0		0					
8-25-31	0	0	0	:15	.04		.01	:36			.142					
9-1	.20	0	0	:23	.08		.02	:44			.317					
9-2-7	0	0	0	:30	1.20		.16	:50			.279					
9-8	.64	0	0	:34	2.70		.34	7:00			.778					
9-9	.82	0	0	:41	1.54		.52	:04			1.54					
9-10	.69	0	0	:50	.67		.62	:24			.400					
9-11	.12	0	0	:55	.96		.70	:36			.183					
9-12	0	0	0	7:00	3.48		.99	:46			.0865					
9-13	.30	0	0	:02	4.80		1.15	8:00			.0447					
9-14	1.22	0	0	:10	1.05		1.25	:14			.0198					
9-15-16	0	0	0	:12	3.00		1.39	:20			.0598					
9-17	.58	0	0	:30	.33		1.19	:28			.197					
9-18	1.04	0	0	8:14	.04		1.52	:40			.778					
9-19	0	0	0	:18	1.65		1.63	9:02			.168					
9-20	.49	0	0	:30	.75		1.78	:24			.0865					
9-21-22	0	0	0	:38	1.95		2.04	:30			.0520					
9-23	.81 1/2	0	0	:52	.17		2.08	10:20			.0153					
				10:50	.05		2.18									
				12:00m	.01		2.19									
Watershed conditions: Cover in second year meadow of a corn, wheat, meadow, meadow rotation. Grass 5" high, alfalfa 6", clover 4", weeds 18" high. (In conservation practice).																
Notes: To convert runoff in in/hr to cfs, multiply by 0.65542. 1/ Most of rain occurred after 4:00p.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 103		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	0	0	6-12-57	Raingage	107	6-12-57		
5-14	1.31	0	3:07p	0	0	3:39p	0	0
5-15	.03	0	:12	.84	.07	:55	3.45	.41
5-16-17	0	0	:18	1.30	.20	:57	4.01	.54
			:23	.72	.26	4:07	1.49	1.00
5-18	.18	0	:29	4.10	.67	:13	.656	1.10
5-19	.23	0	:41	4.75	1.62	:19	.279	1.15
5-20	.20	0	:48	5.40	2.25	:27	.155	1.18
5-21	0	0	:53	7.20	2.85	:49	.0865	1.21
5-22	.51	0	4:00	4.11	3.33	5:35	0	1.24
5-23-25	0	0	:14	.09	3.35			
5-26	.16	0	:23	.27	3.39			
5-27-31	0	0	:45	.27	3.49			
6-1	.12	0	5:30	.05	3.53			
6-2-7	0	0						
6-8	1.00	0						
6-9-10	0	0						
6-11	.29	0						
6-12	0	0						
Watershed conditions: Cover in second year meadow of a corn, wheat, meadow, meadow rotation. Hay cut June 3. Legumes and grass 3" high; weeds 4" high. (Conservation practice)								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage	107	6-28-57		
6-1	.12	0	12:00n	0	0	4:39p	0	0
6-2-7	0	0	:15p	.04	.01	:50	.0380	.01
6-8	1.00	0	1:00	0	.01	5:10	.0313	.02
6-9-10	0	0	:06	1.70	.18	:20	.0520	.03
6-11	.29	0	:40	.02	.19	:30	.107	.04
6-12	3.53	1.24	:45	1.32	.30	:42	.228	.07
6-13	.34	.03	2:00	.04	.31	:50	.245	.10
6-14	.09	0	:07	.51	.37	:58	.279	.14
6-15	0	0	:35	.04	.39	6:16	.545	.25
6-16	.06	0	:50	.24	.45	:18	.600	.27
6-17-18	.04	0	:56	.80	.53	:28	.572	.37
6-19	.04	0	1:23	.07	.63	:44	.519	.42
6-20-21	.04	0	:30	1.11	.76	:44	.986	.53
6-22	.06	0	:45	.28	.83	:50	1.94	.67
6-24	2.22	0.02	5:05	.23	.90	:54	1.79	.80
6-25-27	0	0	:22	.35	1.00	7:02	.914	.97
6-28	.16 1/2	0	:30	.60	1.08	:10	.656	1.08
			:45	.48	1.20	:28	.279	1.21
			:55	.54	1.29	:40	.212	1.26
Watershed conditions: Cover in second year meadow of a corn, wheat, meadow, meadow rotation. Legumes and grass 6" high; weeds 6" high. (Conservation practice)								
			6:05	.66	1.40	8:20	.0682	1.35
			:15	.60	1.50	:50	.0253	1.38
			:20	.84	1.57	9:40	0	1.39
			:30	.66	1.68			
			:35	.96	1.76			
			:40	1.08	1.85			
			:46	1.50	2.00			
			:51	2.40	2.20			
			:55	1.50	2.30			
			7:06	.55	2.40			
			:23	.35	2.50			
			:45	.19	2.57			
			8:00	.12	2.60			
Notes: 1/ Rain ended about 7:20a.								

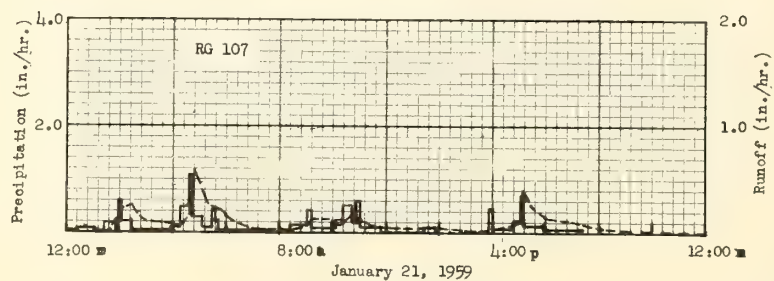
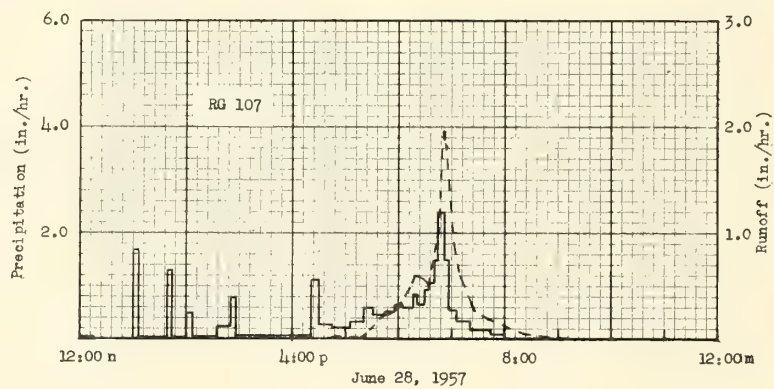
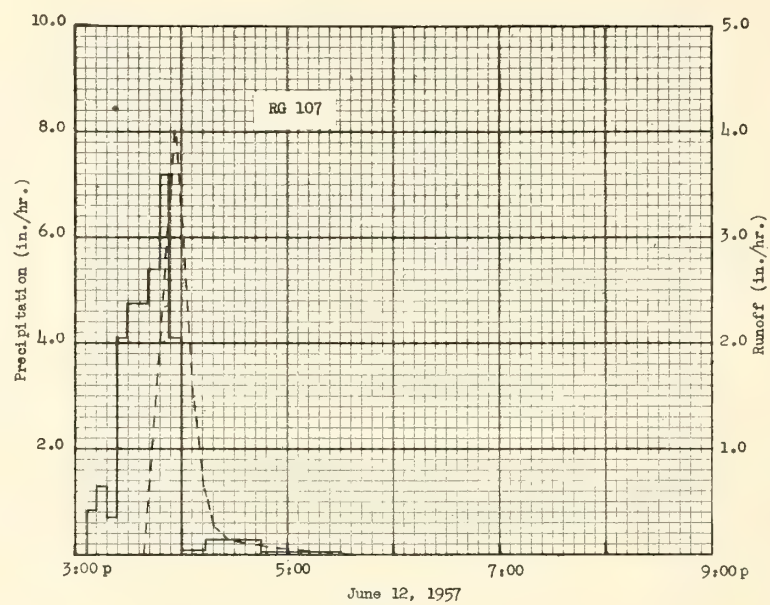
SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 103					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Rain gauge	1.07	1-21-59		
12-23	0	0	12:01a	0		1:00a	0	0
12-24	0 1/2	0	:23	.03	.01	:40	.0380	.01
12-25-31	0	0	1:03	.08	.06	:54	.130	.03
1-1-59	.65	0	:23	.06	.08	2:10	.228	.08
1-2-3	0	0	:53	.20	.18	:26	.262	.14
1-4	0 .02 1/2	0	:56	0	.18	:40	.183	.20
1-5-8	0	0	2:03	.60	.25	3:00	.118	.25
1-9-10	0 1/2	0	:28	.22	.34	:36	.0966	.31
1-11-13	0	0	3:56	.06	.43	4:18	.0682	.36
1-14	.26	0	4:15	.13	.47	:36	.183	.39
1-15	.60	0	:34	.51	.63	:48	.600	.48
1-16-19	.30 1/2	0	:42	1.12	.78	5:10	.400	.64
1-20	.43	0	5:08	.32	.92	:20	.279	.70
			:28	.09	.95	:48	.212	.81
			:36	.45	1.01	6:00	.155	.84
			:44	.22	1.04	:20	.0966	.89
			7:48	.04	1.13	:50	.0520	.92
			8:23	0	1.13	7:20	.0380	.94
			9:03	.18	1.25	8:30	.0380	.99
			:13	.42	1.32	:50	.0598	1.01
			10:08	.11	1.42	9:20	.130	1.06
			:23	.24	1.48	:50	.130	1.12
			:41	.50	1.63	10:12	.0865	1.16
			:56	.20	1.68	:26	.107	1.18
			11:03	.60	1.75	:40	.183	1.22
			:48	.12	1.84	11:06	.107	1.29
			1:28p	.01	1.85	:30	.0682	1.32
			:53	.12	1.90	1:00p	.0520	1.40
			3:53	0	1.90	:50	.0682	1.45
			4:01	.45	1.96	3:26	.0198	1.52
			:48	.08	2.02	4:00	.0313	1.53
			5:01	.23	2.07	:50	.0771	1.58
			:11	.72	2.19	5:04	.130	1.61
			:53	.16	2.30	:10	.400	1.63
			7:23	0.07	2.40	:26	.0279	1.72
						6:00	.155	1.83
						7:00	.107	1.95
						8:10	.0520	2.04
						12:00m	.0153	2.15

Notes: 1/ Snow  
2/ Rain and Snow

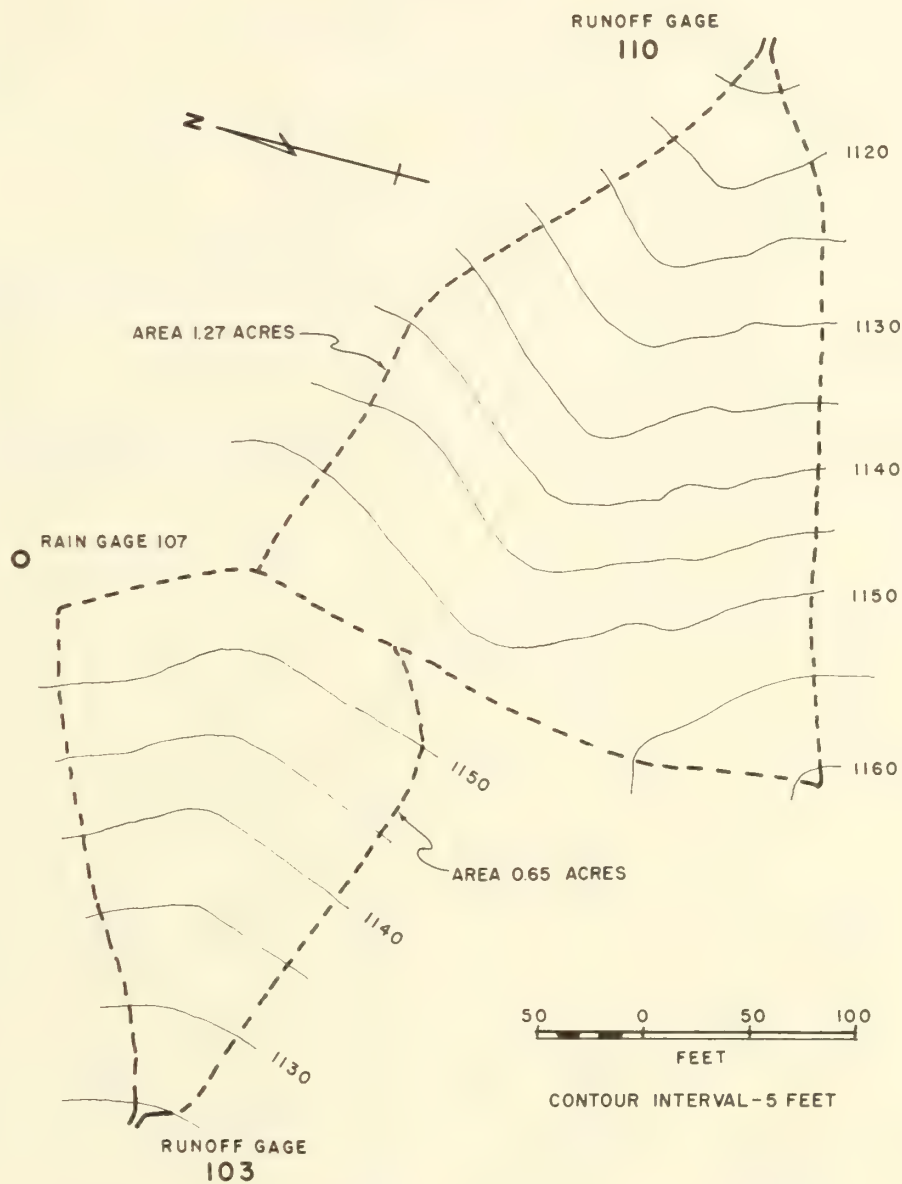


COSHOCTON, OHIO WATERSHED 103





COSHOCTON, OHIO WATERSHED 103



COSHOCTON, OHIO  
WATERSHEDS 103,110

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 110 (Area - 1.27 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	1.60 .09	5.34 1.26	3.49 .15	3.77 .02	6.94 .30	4.39 .09	6.18 .26	3.92 0	1.33 0	1.15 0	1.35 0	3.61 0	43.07 2.17			
1957 P Q	1.59 .08	1.34 T	1.80 0	4.96 .46	3.96 0	10.55 2.41	3.71 .05	2.23 .01	3.72 .01	1.53 0	2.72 T	3.99 .38	42.10 3.40			
1958 P Q	1.48 .06	.58 .08	.98 0	3.37 0	2.88 .01	4.24 .01	8.43 .85	2.79 .04	3.16 .01	.30 0	1.81 0	.51 0	30.53 1.06			
1959 P Q	5.21 2.13	2.84 .60	2.33 .01	4.02 .03	2.79 T	4.15 T	4.43 T	2.40 .44	2.84 0	4.90 0	2.64 .03	2.11 .06	40.66 3.00			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshooton, Ohio Watershed 110								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	4.24	6-12	1.20	6-12	1.22	6-12	1.22	6-12	1.22	6-12	1.22	6-12	1.22	6-12	1.22
1958	7-31	1.54	7-22	.23	7-22	.24	7-22	.24	7-31	.27	7-30	.36	7-30	.36	7-28	.42
1959	1-21	.48	1-21	.36	1-21	.53	1-21	.94	1-21	1.64	1-20	2.10	1-20	2.10	1-20	2.10
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, 1st year meadow; 1957, 2nd year meadow; 1958, corn; 1959, wheat; prevailing practice.																
SELECTED RUNOFF EVENTS								Coshooton, Ohio watershed 110								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Rainage	107	9-23-45										
8-24	.06	0	5:25p	0	0	6:24p	0	0								
8-25-31	0	0	:26	1.20	.02	:42	.108	.01								
9-1	.20	0	:29	3.80	.21	:48	.173	.02								
9-2-7	0	0	:36	1.54	.39	:56	.444	.04								
9-8	.64	0	:38	.60	.41	7:02	.342	.06								
9-9	.82	0	:48	.84	.55	:06	.905	.11								
9-10	.69	0	:50	.60	.57	:12	.597	.18								
9-11	.12	0	6:15	.02	.58	:26	.270	.29								
9-12	0	0	:16	.60	.59	:38	.108	.33								
9-13	.30	0	:23	0	.59	:50	.0521	.34								
9-14	1.22	0	:30	1.20	.73	8:02	.0233	.35								
9-15-16	0	0	:34	2.70	.91	:44	.0123	.35								
9-17	.58	0	:41	1.54	1.09	:44	.0363	.36								
9-18	1.04	0	:50	.67	1.19	:30	.0997	.36								
9-19	0	0	:55	.96	1.27	:36	.270	.38								
9-20	.49	0	7:00	3.48	1.56	:42	.516	.42								
9-21-22	0	0	:02	4.80	1.72	9:04	.125	.53								
9-23	.24 1/2	0	:10	1.05	1.86	:12	.0774	.54								
			:12	3.00	1.96	:40	.0233	.56								
			:30	.33	2.06	11:00	0	.57								
			8:14	.04	2.09											
			:18	1.65	2.20											
			:30	.75	2.35											
			:38	1.95	2.61											
			:52	.17	2.65											
			10:50	.05	2.75											
			12:00m	.01	2.76											
Watershed conditions: Cover in second year meadow of a 4-year rotation of corn, wheat, meadow, meadow. Grass 8" high; weeds 15" high. In prevailing practice since 1942.																
Notes: To convert runoff in in/hr to cfs, multiply by 1.2806. 1/ Most of rain occurred after 3:25p.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 110		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 12, 1957</u>								
			6-12-57	Rainage	107	6-12-57		
5-13-57	0	0	3:07p	0	0	3:39p	0	0
5-14	1.31	0	:12	.84	.07	:43	.112	.01
5-15	.03	0	:18	1.30	.20	:45	1.51	.04
5-16-17	0	0	:23	.72	.26	:51	2.62	.20
5-18	.18	0	:29	1.10	.67	:57	1.20	.60
5-19	.23	0	:41	1.75	1.62	:59	3.98	.70
5-20	.20	0	:48	5.40	2.25	1:01	3.48	.86
5-21	0	0	:53	7.20	2.85	:10	.40	1.11
5-22	.51	0	1:00	1.11	3.33	:15	.312	1.15
5-23-25	0	0	:11	.09	3.35	:21	.173	1.17
5-26	.16	0	:23	.27	3.39	:27	.0919	1.18
5-27-31	0	0	:45	.27	3.19	16:11	0	1.22
6-1	.12	0	5:30	.05	3.53			
6-2-7	0	0						
6-8	e 1.00	0						
6-9-10	0	0						
6-11	.29	0						
6-12	0	0						
Watershed conditions: Cover in second year meadow of a corn, wheat, meadow, meadow rotation. In prevailing practice since 1942. Grass and legumes 12" high; weeds 12" high.								
<u>Event of June 28, 1957</u>								
5-28-31-57	0	0	6-28-57	Rainage	107	6-28-57		
6-1	.12	0	12:00m	0	0	1:34p	0	0
6-2-7	0	0	:15p	.01	.01	:42	.0706	.01
6-8	e 1.00	0	1:00	0	.01	5:00	.0363	.02
6-9-10	0	0	:06	1.70	.18	:20	.0113	.03
6-11	.29	0	:10	.02	.19	:40	.163	.07
6-12	3.53	1.22	:15	1.32	.30	6:00	.219	.13
6-13	.30	0	2:00	.01	.31	:10	.297	.17
6-14	.09	0	:07	.51	.37	:20	.478	.23
6-15	0	0	:35	.01	.39	:40	.197	.39
6-16	.06	0	:50	.21	.45	:48	1.11	.48
6-17-18	0	0	:56	.80	.53	:54	1.66	.63
6-19	.01	0	1:23	.07	.63	:56	1.51	.68
6-20-22	0	0	:30	1.11	.76	7:08	.610	.89
6-23	.06	0	:45	.28	.83	:26	.244	1.02
6-24	2.22	.02	5:05	.21	.90	:44	.163	1.09
6-25-27	0	0	:22	.35	1.00	:54	.125	1.11
6-28	.151	0	:30	.60	1.08	8:10	.061	1.14
			:45	.48	1.20	:30	.0317	1.15
			:55	.54	1.29	10:00	0	1.16
			6:05	.66	1.40			
			:15	.60	1.50			
			:20	.84	1.57			
			:30	.66	1.68			
			:35	.96	1.76			
			:40	1.08	1.85			
			:46	1.50	2.00			
			:51	2.40	2.20			
			:55	1.50	2.30			
			7:06	.55	2.40			
			:23	.35	2.50			
			:45	.19	2.57			
			8:00	.12	2.60			
Watershed conditions: Cover in second year meadow of a corn, wheat, meadow, meadow rotation. In prevailing practice since 1942. Grass and legumes cut for hay June 26.								
Notes: 1/ Rain ended about 7:30a.								

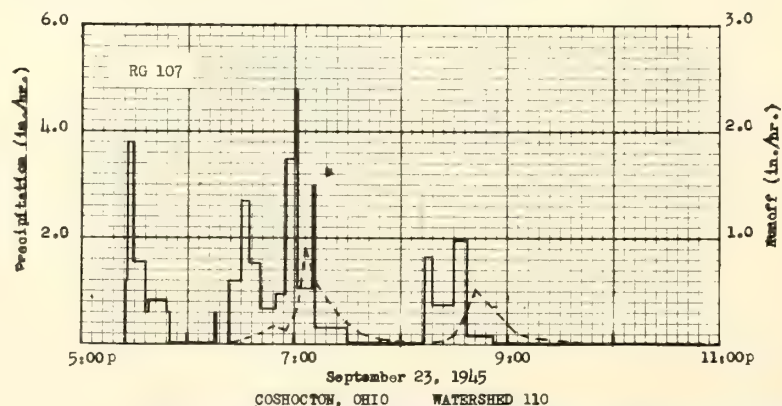


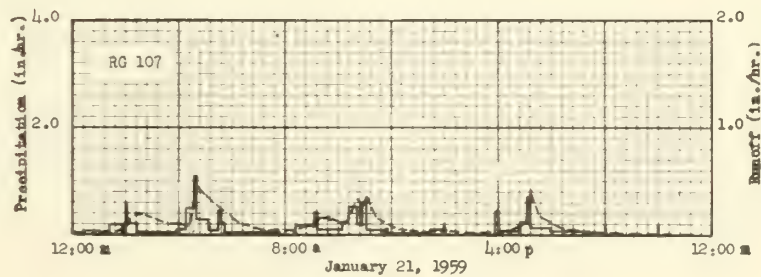
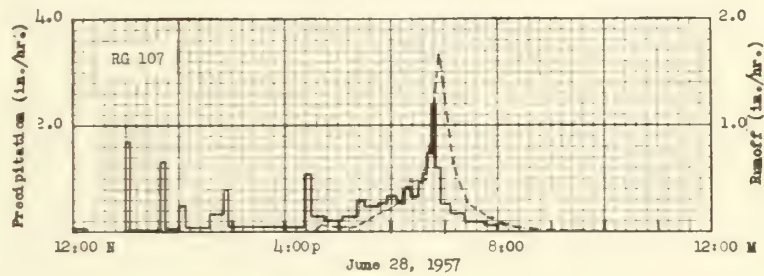
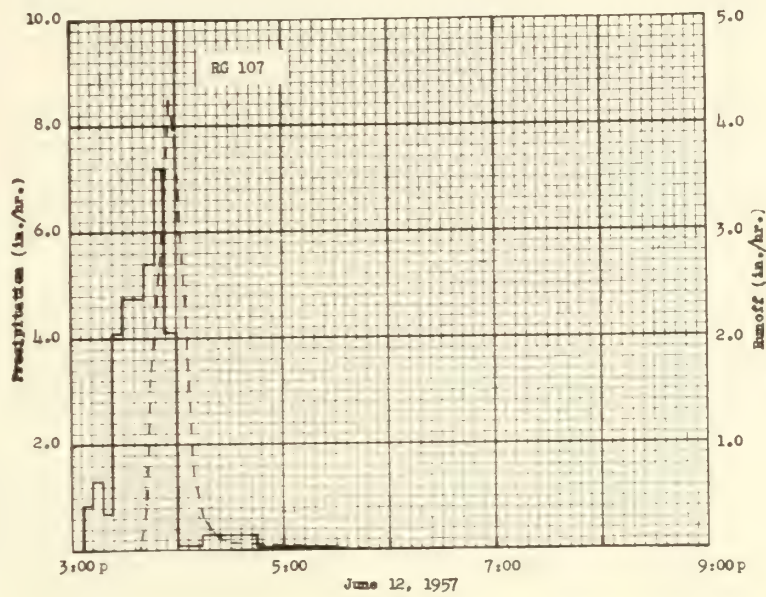
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 110		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Raingage	107	1-21-59		
12-23	T 1/	0	12:01a	0	0	12:01a	0	0
12-24	T	0	1:23	.03	.01	1:31	.0094	T
12-25-31	0	0	1:03	.08	.06	1:55	.0706	.01
1-1-59	.65	.03	1:23	.06	.08	2:15	.184	.06
1-2-3	0	0	1:53	.20	.18	3:35	.195	.12
1-4	.02 1/	0	1:56	0	.18	3:35	.108	.26
1-5-8	0	0	2:03	.60	.25	4:03	.108	.31
1-9-10	T 1/	0	2:28	.22	.34	4:15	.0845	.33
1-11-13	0	0	3:56	.06	.43	4:29	.134	.35
1-14	.26 2/	0	4:15	.13	.47	4:41	.478	.42
1-15	.60 1/	0	4:34	.51	.63	5:03	.374	.56
1-16-19	.30 1/	0	4:42	1.12	.78	5:17	.219	.78
1-20	.43	T	5:08	.32	.92	6:15	.116	.86
			5:28	.09	.95	7:15	.0613	.92
			5:36	.45	1.01	7:55	.0521	.95
			5:44	.22	1.04	8:25	.0613	.98
			7:48	.04	1.13	9:05	.108	1.02
			8:23	0	1.13	9:19	.163	1.06
			9:03	.18	1.25	9:41	.163	1.12
			10:13	.42	1.32	10:13	.108	1.19
			10:08	.11	1.42	10:25	.163	1.22
			10:23	.24	1.48	10:43	.342	1.29
			10:41	.50	1.63	10:55	.284	1.36
			10:56	.20	1.68	11:05	.358	1.41
			11:03	.60	1.75	11:25	.184	1.50
			11:48	.12	1.84	11:45	.125	1.55
			11:28p	.01	1.85	12:15p	.0579	1.59
			11:53	.12	1.90	12:15	.0233	1.63
			12:53	0	1.90	12:49	.0521	1.65
			1:01	.45	1.96	1:45	.0233	1.68
			1:48	.08	2.02	1:55	.0363	1.71
			2:01	.23	2.07	2:33	.0579	1.74
			2:11	.72	2.19	2:53	.108	1.77
			2:53	.16	2.30	3:11	.424	1.84
			3:23	.07	2.40	3:21	.297	1.87
						3:35	.163	1.93
						3:55	.116	1.97
						6:25	.0641	2.02
						7:25	.0363	2.07
						8:15	.0156	2.09
						11:15	0	2.10

Notes: 1/ Snow

2/ Rain and Snow

See map of watershed on page 26.14-5.





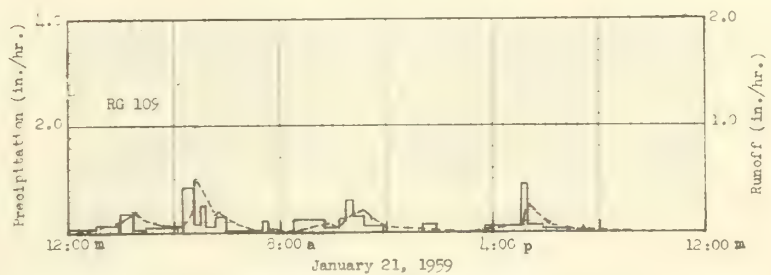
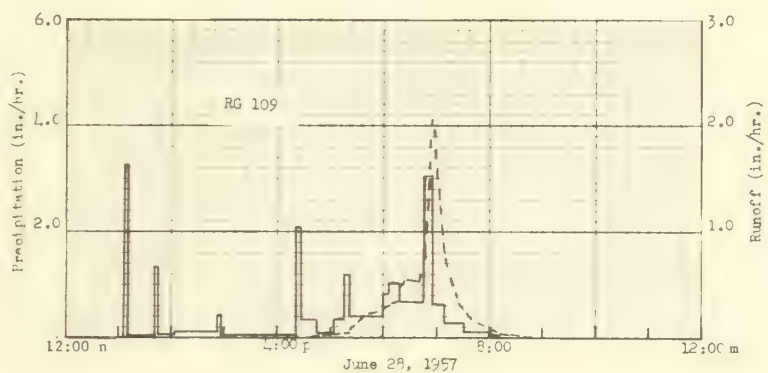
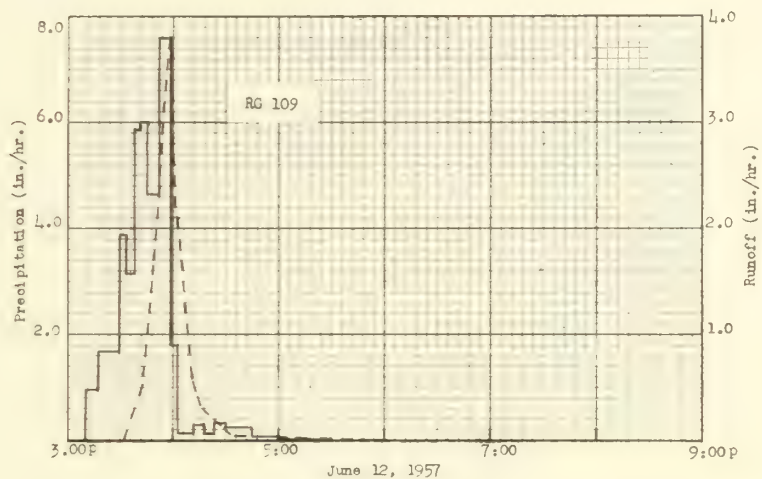
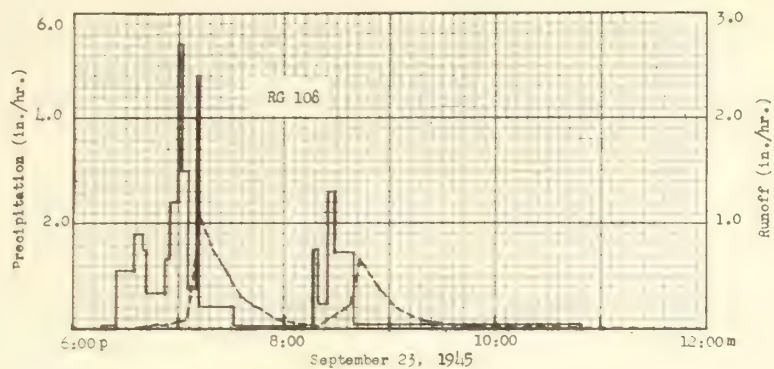
COSHOCTON, OHIO      WATERSHED 110

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 113 (Area - 1.45 acres)								
Month Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	1.62 .36	5.51 1.95	3.87 .06	4.07 0	7.24 .05	4.57 .01	6.31 .06	4.34 .01	1.62 0	1.27 0	1.50 0	3.30 0	15.22 2.50			
1957 P Q	1.63 .09	1.15 0	1.84 0	4.86 .29	4.37 T	10.53 2.36	3.64 T	2.14 .04	4.19 .03	1.68 0	2.92 0	4.16 .42	43.41 3.23			
1958 P Q	1.55 .27	.70 .11	.98 0	3.66 0	3.20 .19	4.36 0	8.10 .14	2.65 0	3.01 0	.37 0	2.10 0	.75 0	31.73 .71			
1959 P Q	5.74 1.49	3.17 .40	2.46 0	4.10 .01	2.74 0	4.03 0	4.49 .02	2.30 .08	2.90 0	5.57 .02	2.82 0	2.30 T	42.62 2.02			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 113								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	3.77	6-12	0.89	6-28	1.17	6-28	1.35	6-28	1.35	6-28	1.35	6-28	1.35	6-28	1.14
1958	7-31	.25	5-4	.10	5-4	.16	5-4	.19	5-4	.10	5-4	.19	5-4	.19	1-21	.27
1959	1-21	.50	1-21	.34	1-21	.48	1-21	.63	1-21	1.21	1-20	1.49	1-20	1.49	1-20	1.49
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, wheat; 1957, 1st year meadow; 1958, 2nd year meadow; 1959, corn; conservation practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 113								
Antecedent conditions			Rainfall						Runoff							
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Rainage	108 1/	9-23-45										
8-24	.06	0	6:16 p	0	0	6:38 p	0	0								
8-25-31	0	0	:25	.07	.01	:18	.0408	T								
9-1	.18	0	:34	1.13	.18	:54	.0362	.01								
9-2-7	0	0	:40	1.80	.36	7:04	.0944	.02								
9-8	.84	0	:42	1.50	.41	:07	.248	.03								
9-9	.92	0	:52	.66	.52	:12	1.08	.08								
9-10	.79	0	:56	1.35	.61	:20	.752	.20								
9-11	.03	0	7:00	2.40	.77	:36	.300	.33								
9-12	0	0	:02	5.40	.95	:44	.213	.36								
9-13	.29	0	:06	3.00	1.15	:56	.0944	.39								
9-14	1.29	0	:10	.75	1.20	8:06	.0562	.40								
9-15-16	0	0	:12	4.80	1.36	:20	.0239	.41								
9-17	.53	0	:32	.42	1.50	:38	.237	.44								
9-18	1.04	T	8:10	.06	1.54	:44	.661	.49								
9-19	0	0	:16	0	1.54	:54	.387	.57								
9-20	.57	0	:20	1.50	1.64	9:04	.202	.62								
9-21-22	0	0	:25	.48	1.68	:18	.0944	.65								
9-23	.90 2/	0	:28	2.60	1.81	:30	.0507	.67								
			:40	1.45	2.10	:50	.0204	.68								
			10:50	.08	2.27	12:00m	.0003	.69								
						9-24-45										
						1:30 a	0	.69								
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1943. First year meadow in 1945. Grass and clover 3" high, weeds 18" high.																
Notes: To convert runoff in in/hr to cfs, multiply by 1.4621. 1/ Rainage 108 used for this storm. No record on rainage 109. 2/ Most of rain occurred after 4:16p.																

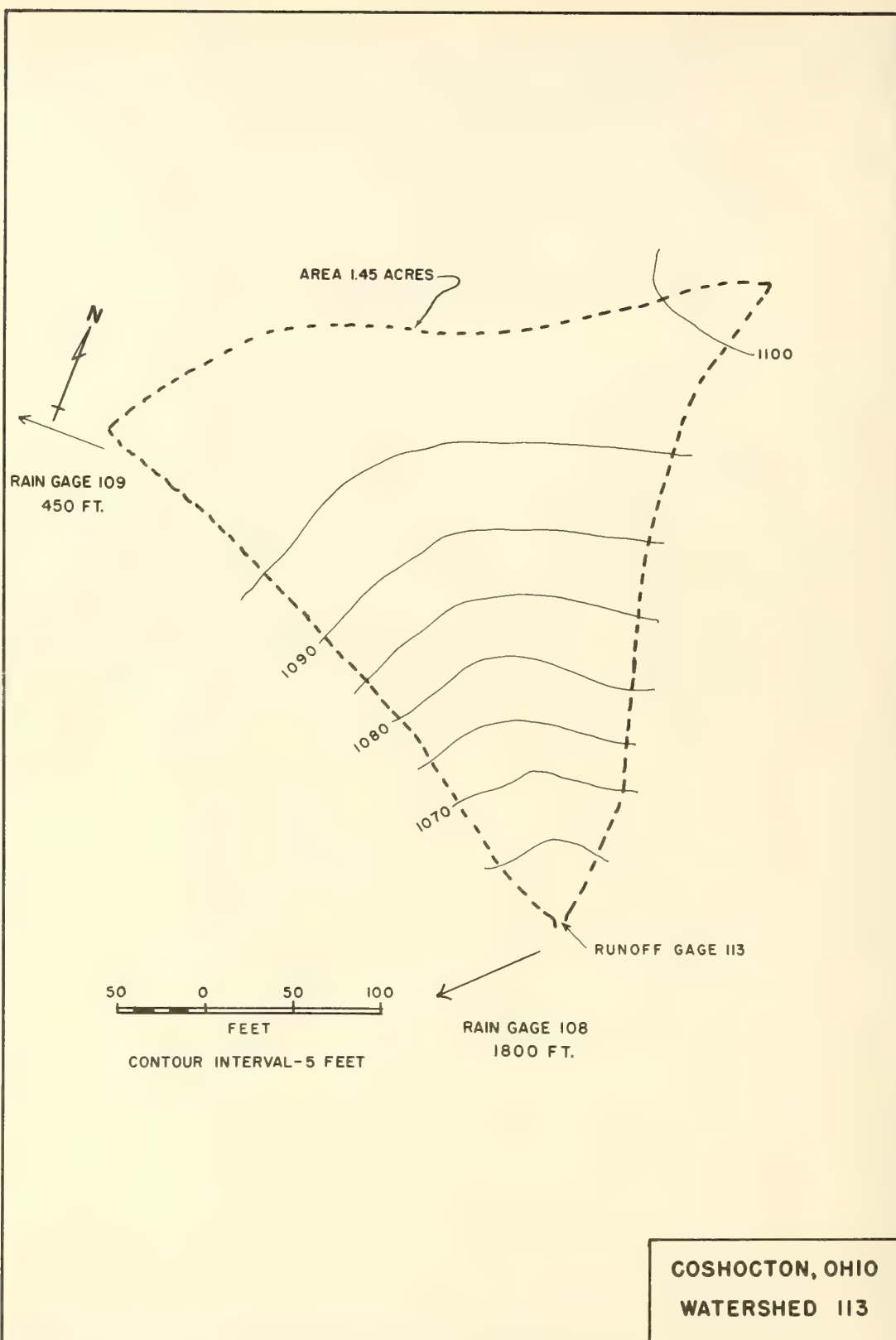
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 113		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
			6-12-57	Raingage	109	6-12-57		
5-13-57	0	0	3:10p	0	0	3:33p	0	0
5-14	1.79	T	:17	.94	.11	:43	.523	.02
5-15	.06	0	:29	1.65	.44	:49	1.66	.12
5-16-17	0	0	:33	3.90	.70	:57	3.77	.41
5-18	.16	0	:37	3.15	.91	4:01	2.20	.59
5-19	.26	0	:41	5.85	1.30	:11	.561	.80
5-20	.19	0	:45	6.00	1.70	:15	.356	.83
5-21	0	0	:52	4.63	2.24	:33	.0678	.88
5-22	.51	0	:58	7.60	3.00	5:57	0	.91
5-23-25	0	0	4:03	1.80	3.15			
5-26	.17	0	:12	.13	3.17			
5-27-31	0	0	:18	.30	3.20			
6-1	.10	0	:23	.12	3.21			
6-2-7	0	0	:30	.34	3.25			
6-8	.86	0	:45	.24	3.31			
6-9-10	0	0	5:00	.08	3.33			
6-11	.35	0	:30	.02	3.34			
6-12	0	0						
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1943. First year meadow in 1957. Grass and legumes cut for hay on June 10.								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage	109	6-28-57		
6-1	.10	0	1:05p	0	0	4:22p	0	0
6-2-7	0	0	:09	3.30	.22	:46	.0239	.01
6-8	.86	0	:40	.02	.23	:58	.0408	.01
6-9-10	0	0	:44	1.35	.32	5:22	.0807	.03
6-11	.35	0	2:03	.03	.33	:26	.143	.04
6-12	3.34	.91	:50	.14	.44	:42	.248	.09
6-13	.39	T	:57	.43	.49	6:00	.274	.17
6-14	.02	0	4:22	.07	.59	:08	.328	.21
6-15	0	0	:26	2.10	.73	:16	.342	.26
6-16	.38	0	:45	.35	.84	:20	.505	.29
6-17-18	0	0	5:03	.10	.87	:24	.561	.32
6-19	.02	0	:15	.35	.94	:40	.542	.47
6-20-22	0	0	:22	1.20	1.08	:48	.773	.55
6-23	.06	0	6:00	.40	1.33	:52	1.32	.62
6-24	2.03	.09	:05	.84	1.40	:55	2.08	.71
6-25-27	0	0	:18	1.06	1.63	7:02	1.32	.92
6-28	.14	0	:45	.71	1.95	:06	.971	.99
			:55	3.06	2.46	:10	.773	1.05
			7:10	.64	2.62	:24	.387	1.18
			:30	.30	2.72	:30	.287	1.22
			8:00	.14	2.79	:40	.192	1.26
			:10	.06	2.80	8:00	.109	1.31
						:12	.0678	1.32
						:34	.0278	1.34
						9:00	0.0083	1.35
						10:30	0	1.35
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1943. First year meadow in 1957. Legumes and grass 6" high, weeds 6" high.								
Notes:								



SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 113		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Raingage	109	1-21-59		
12-23	T 1/	0	12:01a	0	0	12:19a	0.0137	0
12-24	T 1/	0	1:00	.08	.08	1:59	.102	.08
12-25-31	0	0	:51	.13	.19	2:29	.202	.16
1-1-59	.66	0	:56	0	.19	4:9	.134	.22
1-2-3	0 1/	0	2:26	.34	.36	3:29	.0807	.28
1-4	.04 1/	0	:56	.04	.38	4:19	.0562	.33
1-5-8	0 1/	0	4:09	.11	.51	:29	.109	.35
1-9-10	T 1/	0	:16	0	.51	:39	.248	.37
1-11-13	0	0	4:1	.84	.86	4:9	.505	.44
1-14	.28 2/	0	:56	.16	.90	5:23	.248	.66
1-15	.70 1/	0	5:11	.52	1.03	:33	.171	.69
1-16-19	.30 1/	0	:30	.09	1.06	:41	.192	.72
1-20	.45	T	:56	.30	1.19	6:19	.0873	.81
			7:19	.01	1.20	:59	.0204	.84
			:31	.20	1.24	8:29	.0042	.86
			:51	.06	1.26	9:09	.0562	.87
			8:28	0	1.26	:47	.0873	.93
			9:41	.24	1.56	10:13	.0507	.95
			10:11	.10	1.61	:29	.102	.97
			:26	.24	1.67	11:05	.213	1.08
			4:1	.60	1.82	:29	.126	1.15
			11:05	.32	1.95	:59	.0562	1.19
			:51	.12	2.04	3:09 P	0	1.23
			1:21p	0	2.04	5:05	.0678	1.24
			:51	.16	2.12	:13	.202	1.26
			3:41	0	2.12	:25	.248	1.31
			5:02	.15	2.32	6:09	.0807	1.41
			:20	.90	2.59	:59	.0362	1.46
			:50	.14	2.66	9:39	0	1.49
			6:51	.07	2.73			
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1943. Second year meadow cover in January 1959. Vegetation dormant. Frost penetration 1". Snow cover 5" on January 20.								
Notes: 1/ Snow 2/ Rain and snow								



COSHOOTEN, OHIO WATERSHED 113



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 118 (Area - 1.96 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	1.71 .15	5.69 1.92	3.89 .23	4.03 .03	7.42 .33	4.45 .10	6.45 .26	4.40 .03	1.60 0	1.18 0	1.53 0	3.42 .01	45.77 3.06			
1957 P Q	1.68 .01	1.42 0	1.84 0	5.04 .11	1.44 .01	10.25 2.16	3.86 T	2.24 T	4.15 .01	1.55 0	2.80 .01	4.13 .29	43.40 2.63			
1958 P Q	1.17 0	.64 0	.99 0	3.38 0	3.15 .08	4.23 0	8.02 .16	2.72 T	2.99 0	.32 0	2.18 0	.71 0	30.80 .24			
1959 P Q	5.68 1.00	3.02 .31	2.47 T	1.04 .08	2.79 0	4.17 .10	1.49 .39	2.36 .57	2.97 T	5.34 .02	2.84 .05	1.88 .10	42.05 2.62			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 118								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	3.11	6-12	1.02	6-12	1.03	6-28	1.06	6-28	1.06	6-28	1.06	6-28	1.06	6-24	1.12
1958	7-31	.18	7-22	.08	7-22	.08	5-4	.08	5-4	.08	5-4	.08	5-4	.08	5-4	.08
1959	8-4	1.07	8-4	.44	8-4	.57	8-4	.57	1-21	.79	1-21	1.00	1-21	1.00	1-21	1.00
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, wheat; 1957, 1st year meadow; 1958, 2nd year meadow; 1959, corn; prevailing practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 118								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Raingage	108	9-23-45										
8-24	.06	0	5:27p	0	0	6:00p	0	0								
8-25-31	0	0	:31	3.30	.22	:40	.0678	.02								
9-1	.1P	0	:36	2.16	.40	:44	.167	.02								
9-2-7	0	0	:47	.16	.43	:50	.278	.05								
9-8	.84	0	:49	3.90	.56	7:06	.815	.14								
9-9	.92	0	:54	.60	.61	:10	1.36	.22								
9-10	.79	0	6:16	0	.61	:24	.901	.50								
9-11	.03	0	:25	.07	.62	:36	.379	.62								
9-12	0	0	:30	1.32	.73	:44	.204	.66								
9-13	.29	0	:34	.90	.79	:50	.112	.68								
9-14	1.29	.01	:40	1.80	.97	:56	.0916	.69								
9-15-16	0	0	:52	.80	1.13	8:18	.0309	.71								
9-17	.53	0	7:00	1.88	1.38	:30	.150	.72								
9-18	1.04	.03	:02	5.40	1.56	:36	.393	.75								
9-19	0	0	:06	3.00	1.76	:44	.815	.83								
9-20	.57	.03	:12	2.10	1.97	:48	.693	.88								
9-21-22	0	0	:32	.42	2.11	9:02	.278	.99								
9-23	.29 1/	0	:40	.15	2.13	:10	.177	1.02								
			8:10	.04	2.15	:16	.119	1.04								
			:20	.60	2.25	:24	.0789	1.05								
			:28	1.28	2.42	:40	.0476	1.07								
			:40	1.45	2.71	10:30	.0146	1.09								
			9:02	.16	2.77	12:00 m	0	1.10								
			10:50	.06	2.88											
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing practice) since 1943. First year meadow in 1945. Grass and weeds 4" high.																
Notes: To convert runoff in in/hr to cfs, multiply by 1.9763. 1/ Most of rain occurred after 3:27p.																

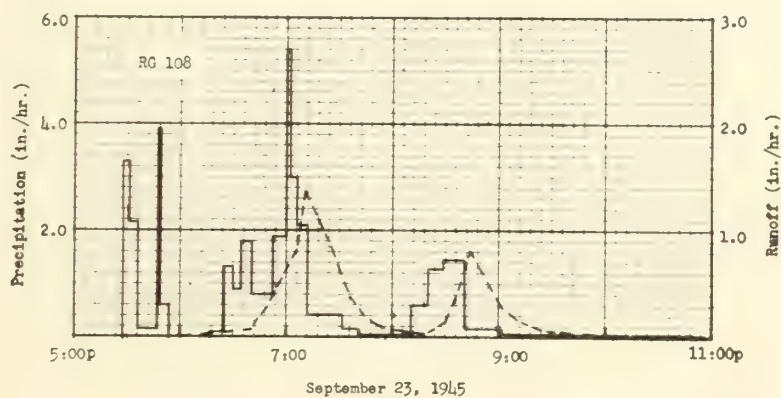


SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 118		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-12-13-57	0	0	6-12-57	Raingage	108	6-12-57		
5-14	1.79	.01	3:09p	0	0	3:38p	0	0
5-15	.04	0	:16	.51	.06	:42	.340	.01
5-16-17	0	0	:20	1.20	.14	:46	1.04	.04
5-18	.16	0	:25	.60	.19	:58	3.11	.15
5-19	.26	0	:30	3.84	.51	4:06	1.60	.78
5-20	.17	0	:32	3.90	.64	:12	.815	.90
5-21	0	0	:42	4.56	1.40	:14	.617	.92
5-22	.50	0	:48	6.00	2.00	:18	.422	.96
5-23-25	0	0	:50	3.90	2.13	:26	.185	1.00
5-26	.14	0	:52	2.10	2.20	:32	.119	1.01
5-27-31	0	0	:56	9.00	2.80	5:08	0	1.03
6-1	.10	0	:58	6.00	3.00			
6-2-7	0	0	4:00	1.50	3.05			
6-8	.88	0	:13	.09	3.07			
6-9-10	0	0	:16	.60	3.10			
6-11	.35	0	:23	.17	3.12			
6-12	0	0	:36	.23	3.17			
			:43	.34	3.21			
			:52	.13	3.23			
			5:23	.04	3.25			
Watershed conditions: In corn, wheat, meadow, meadow rotation (Prevailing practice) since 1943. First year meadow in 1957. Grass, legumes and weeds 15" high.								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage	108	6-28-57		
6-1	.10	0	1:03p	0	0	4:30p	0	0
6-2-7	0	0	:07	3.00	.20	:44	.0476	.01
6-8	.88	0	:38	.04	.22	5:08	.0094	.02
6-9-10	0	0	:42	1.65	.33	:32	.142	.04
6-11	.35	0	2:00	.03	.34	:42	.194	.07
6-12	3.25	1.03	:12	.20	.38	:56	.214	.12
6-13	.33	0	:30	.03	.39	6:02	.290	.14
6-14	.02	0	:48	.20	.45	:12	.326	.19
6-15	0	0	3:15	.13	.51	:16	.451	.22
6-16	.34	0	:40	.05	.53	:34	.439	.36
6-17-18	0	0	4:20	.12	.61	:40	.482	.41
6-19	.02	0	:36	.90	.85	:46	.734	.47
6-20-22	0	0	5:00	.15	.91	:48	1.04	.50
6-23	.06	0	:12	.25	.96	:52	1.36	.58
6-24	2.00	.06	:50	.54	1.30	7:08	.617	.85
6-25-27	0	0	6:00	.72	1.42	:22	.314	.95
6-28	.10 1/	0	:10	.54	1.51	:30	.204	.99
			:17	1.20	1.65	:42	.134	1.02
			:40	.73	1.93	8:16	.0176	1.06
			:46	1.40	2.07	:34	0	1.06
			:54	2.78	2.44			
			7:00	.80	2.52			
			:07	.69	2.60			
			:20	.37	2.68			
			8:00	.17	2.79			
			:10	.06	2.80			
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing practice) since 1943. First year meadow in 1957. Legumes, grass and weeds 4" high.								
Notes: 1/ Rain ended about 7:30a.								

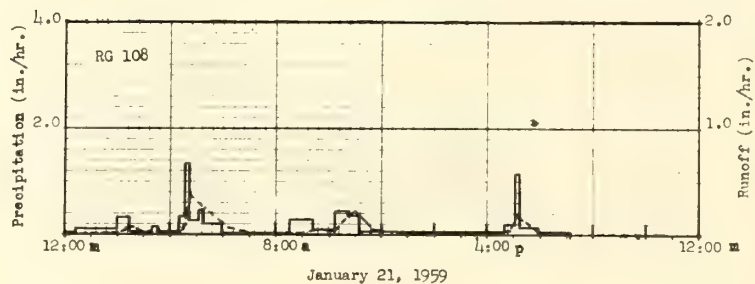
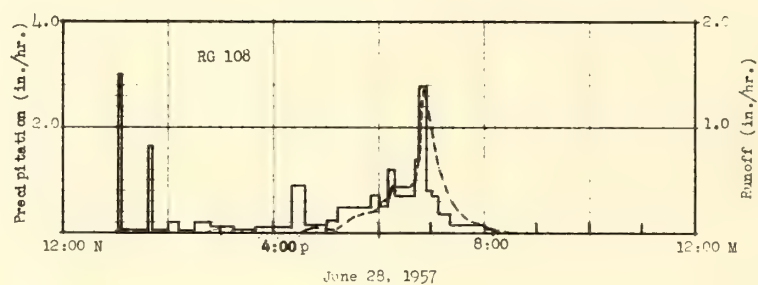
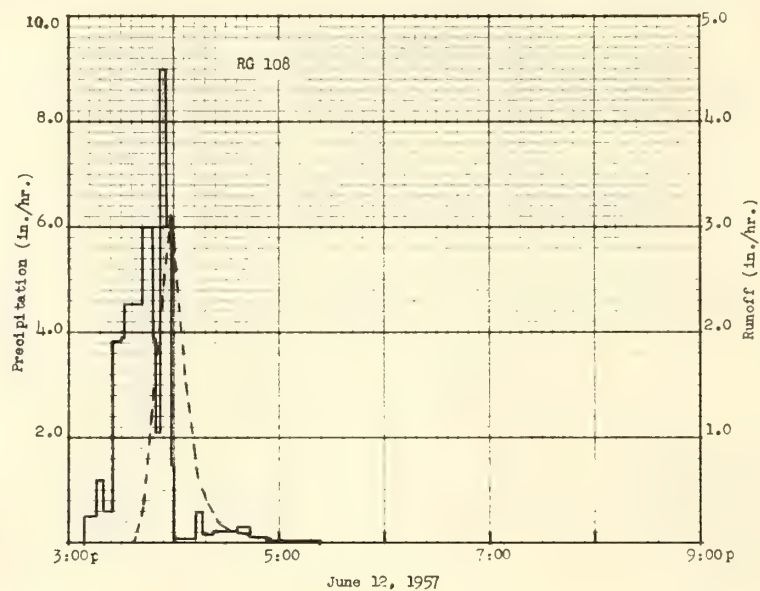
SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 118					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Rainage	108	1-21-59		
12-23	T 1/	0	12:01a	0	0	12:10a	0	0
12-24	T 1/	0	1:26	.05	.02	2:00	.0118	.01
12-25-31	0	0	1:58	.12	.20	2:20	.0572	.02
1-1-59	.60	0	2:26	.36	.37	3:36	.0678	.04
1-2-3	0	0	3:18	.06	.42	3:00	.0176	.05
1-4	.04 1/	0	3:31	.18	.46	3:50	.0094	.06
1-5-8	0 1/	0	4:16	.07	.51	4:30	.0476	.08
1-9-10	T 1/	0	4:32	.38	.61	4:37	.204	.09
1-11-13	0	0	4:43	1.36	.86	4:46	.393	.11
1-14	.27	0	5:03	.27	.95	5:20	.256	.34
1-15	.72 2/	0	5:16	.46	1.05	6:12	.0789	.47
1-16-19	.30 1/	0	5:59	.21	1.20	7:10	.0176	.51
1-20	.48	0	8:28	.03	1.27	8:10	.0037	.51
			9:23	.29	1.54	9:14	.0309	.53
			10:13	.10	1.62	10:46	.0521	.55
			10:43	.44	1.84	10:12	.0309	.57
			11:08	.36	1.99	11:32	.119	.59
			4:36p	.05	2.25	11:00	.224	.67
			5:02	.20	2.33	11:44	.167	.72
			5:13	1.15	2.54	11:40	.0572	.77
			5:53	.15	2.64	1:00p	.0176	.80
			7:08	.06	2.71	4:10	.0053	.84
						4:50	.0431	.85
						5:10	.194	.89
						5:50	.0431	.97
						7:10	.0072	.99
						10:40	0	1.00

Notes: 1/ Snow

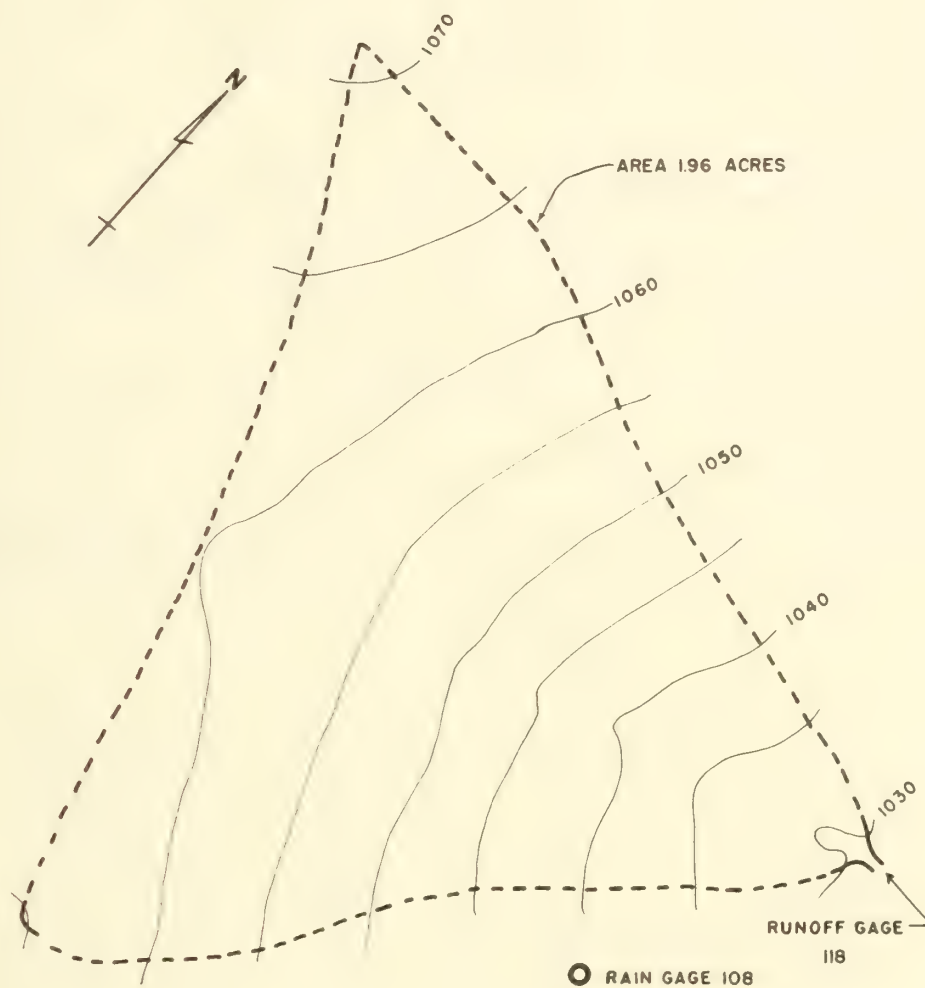
2/ Rain and Snow



COSHOCOTON, OHIO WATERSHED 118



COSHOCTON, OHIO WATERSHED 118



COSHOCTON, OHIO  
WATERSHED 118

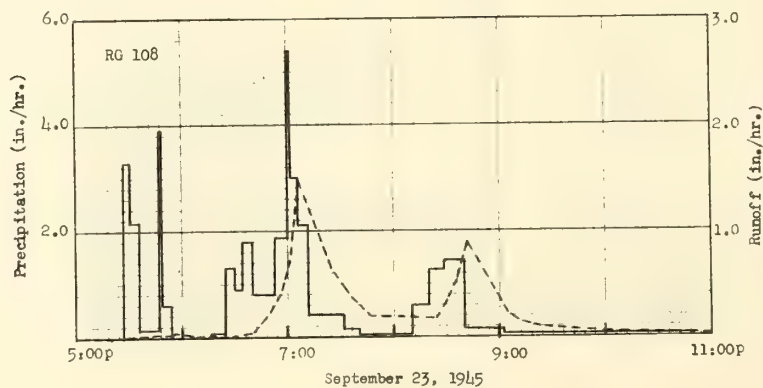




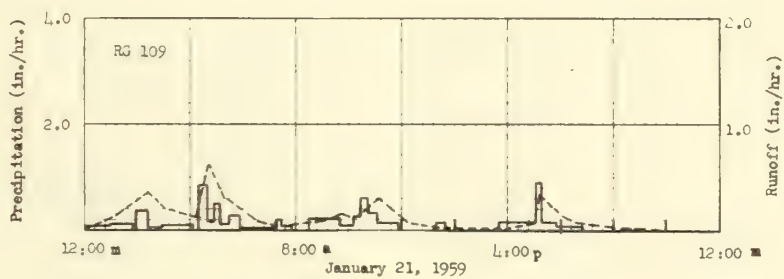
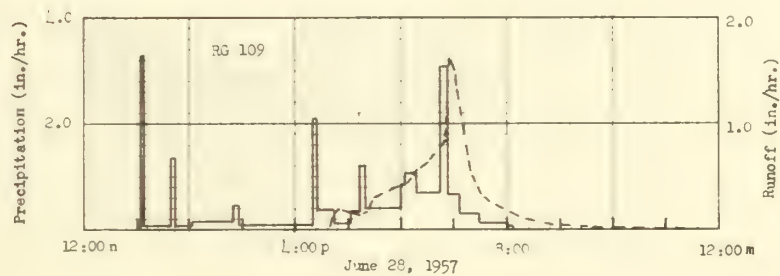
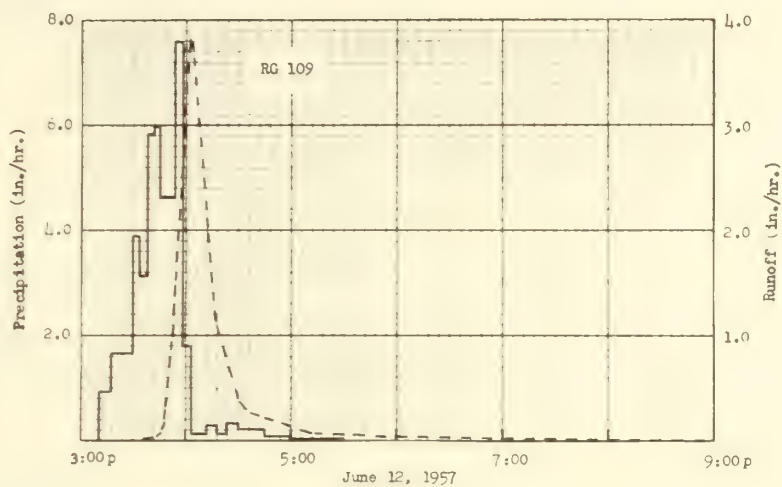
SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 111					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	0	0	6-12-57 3:10p	Rainage 0	109 0	6-12-57 3:26p	0	0
5-14	1.79	.01	:17	.94	.11	:44	.0561	.01
5-15	.06	0	:29	1.65	.44	:46	.0989	.01
5-16-17	0	0	:33	3.90	.70	:48	.176	.01
5-18	.16	0	:37	3.15	.91	:50	.476	.03
5-19	.26	0	:41	5.85	1.30	:52	.950	.05
5-20	.19	0	:45	6.00	1.70	:54	1.62	.09
5-21	0	0	:52	4.63	2.24	4:02	3.82	.45
5-22	.51	0	:58	7.60	3.00	:06	3.38	.70
5-23-25	0	0	4:03	1.80	3.15	:12	2.03	.97
5-26	.17	0	:12	.13	3.17	:18	1.13	1.12
5-27-31	0	0	:18	.30	3.20	:30	.403	1.26
6-1	.10	0	:23	.12	3.21	:36	.276	1.29
6-2-7	0	0	:30	.34	3.25	5:10	.0989	1.39
6-8	.86	0	:45	.24	3.31	:34	.0561	1.42
6-9-17	0	0	5:00	.08	3.33	9:00	0	1.46
6-11	.35	0	:30	.02	3.34			
6-12	0	0						
Watershed conditions: In 4-year rotation of corn, wheat, meadow, meadow (conservation practice with mulch tillage) since 1947. First year meadow in 1957. Legumes and grass and weeds 3" high.								
Event of June 2 <sup>nd</sup> , 1957								
5-28-31-57	0	0	6-28-57 1:05p	Rainage 0	109 0	6-28-57 4:38p	0	0
6-1	.10	0	:09	3.30	.22	:46	.155	.01
6-2-7	0	0	:09	.02	.23	:50	.198	.02
6-8	.86	0	:44	1.35	.32	5:02	.176	.06
6-9-10	0	0						
6-11	.35	0	2:03	.03	.33	:14	.135	.09
6-12	3.34	1.46	:50	.14	.44	:22	.165	.11
6-13	.39	.01	:57	.43	.49	:30	.305	.14
6-14	.02	0	4:22	.07	.59	6:10	.438	.38
6-15	0	0	:26	2.10	.73	:20	.577	.46
6-16	.38	0	:45	.35	.84	:32	.642	.59
6-17-18	0	0	5:03	.10	.87	:50	.839	.80
6-19	.02	0	:15	.35	.94	:56	1.62	.92
6-20-22	0	0	:22	1.20	1.08	7:02	1.47	1.07
6-23	.06	0	6:00	.40	1.33	:04	1.33	1.12
6-24	2.03	.44	:05	.84	1.40	:08	1.07	1.20
6-25-27	0	0	:18	1.06	1.63	:22	.556	1.38
6-28	.14 1/2	0	:45	.71	1.95	:32	.368	1.46
			:55	3.06	2.46	:42	.276	1.51
			7:10	.64	2.62	8:22	.107	1.64
Watershed conditions: In 4-year rotation of corn, wheat, meadow, meadow (conservation practice with mulch tillage) since 1947. First year meadow in 1957. Legumes, grass and weeds 6" high.								
			:30	.30	2.72	:52	.0501	1.68
			8:00	.14	2.79	9:32	.0168	1.70
			:10	.06	2.80	11:52	0	1.71
Notes: 1/ Rain ended about 7:30a.								

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 111		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Raingage	109	1-21-59		
12-23	T	0	12:01a	0	0	12:05a	e 0.0051	0
12-24	T 1/	0	1:00	.08	.08	1:05	.107	.05
12-25-31	0	0	:51	.13	.19	2:27	.352	.36
1-1-59	.66	0	:56	0	.19	3:03	.198	.50
1-2-3	0	0	2:26	.34	.36	4:15	.116	.68
1-4	.04 1/	0	:56	.04	.38	4:45	.620	.83
1-5-8	0	0	4:09	.11	.51	5:21	.305	1.11
1-9-10	T 1/	0	:16	0	.51	6:05	.187	1.28
1-11-13	0	0	:41	.84	.86	:35	.0833	1.35
1-14	.28	0	:56	.16	.90	7:17	.0391	1.39
1-15	.70 2/	0	5:11	.52	1.03	9:05	.0909	1.48
1-16-19	.30 1/	0	:30	.09	1.06	:45	.155	1.57
1-20	.45	T	:56	.30	1.19	10:11	.107	1.62
			7:19	.01	1.20	11:09	.305	1.83
			:31	.20	1.24	12:00n	.116	2.00
			:51	.06	1.26	:13p	.0833	2.02
			8:28	0	1.26	1:25	.0250	2.08
			9:41	.24	1.56	3:55	.0133	2.14
			10:11	.10	1.61	4:59	.0690	2.18
			:26	.24	1.67	5:05	.116	2.19
			:41	.60	1.82	:15	.336	2.23
			11:05	.32	1.95	6:05	.135	2.42
			:51	.12	2.04	:35	.0833	2.47
			1:21p	0	2.04	8:15	.0250	2.56
			:51	.16	2.12	9:47	0	2.57
			3:41	0	2.12			
			5:02	.15	2.32			
			:20	.90	2.59			
			:50	.14	2.66			
			6:51	.07	2.73			
Watershed conditions: In 4-year rotation of corn, wheat, meadow, meadow (conservation practice with mulch tillage) since 1947. Second year meadow cover in January 1959. Vegetation dormant. Frost penetration 1". Snow cover 5" on January 20.								

Notes: 1/ Snow  
2/ Rain and Snow

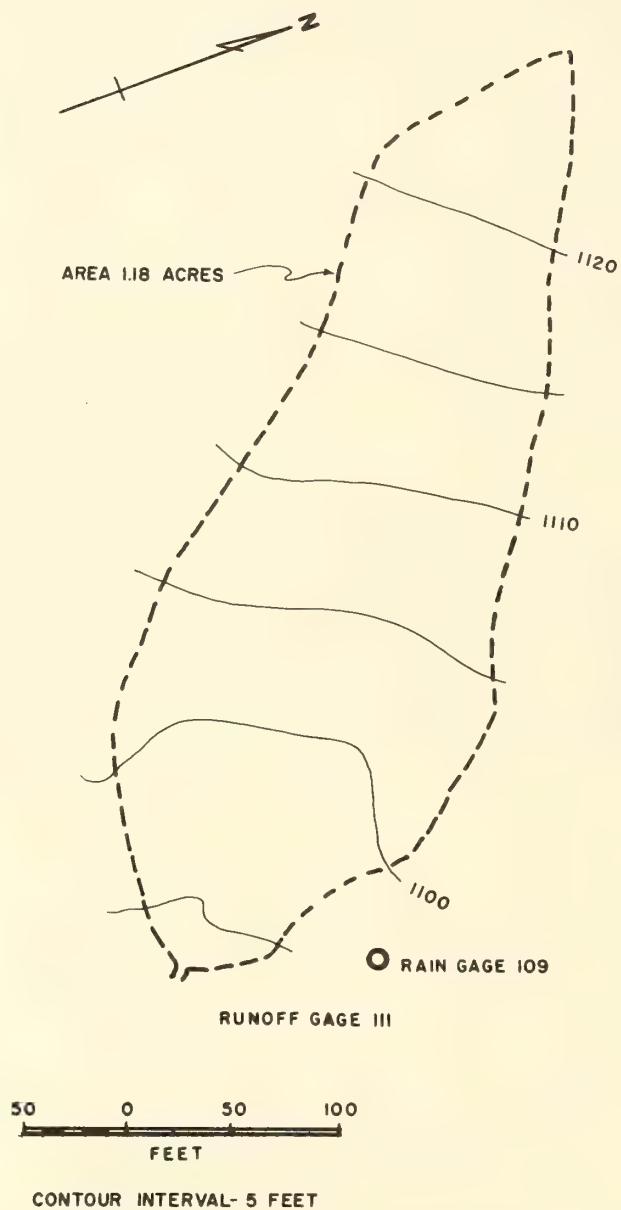


COSHOCTON, OHIO WATERSHED 111



CASHOTON, OHIO      WATERSHED 111



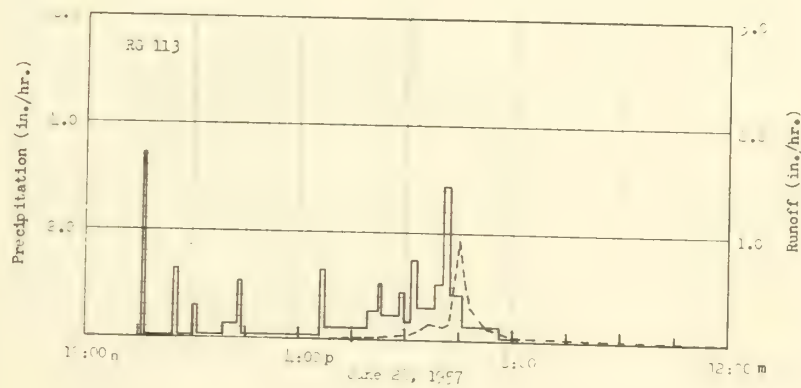
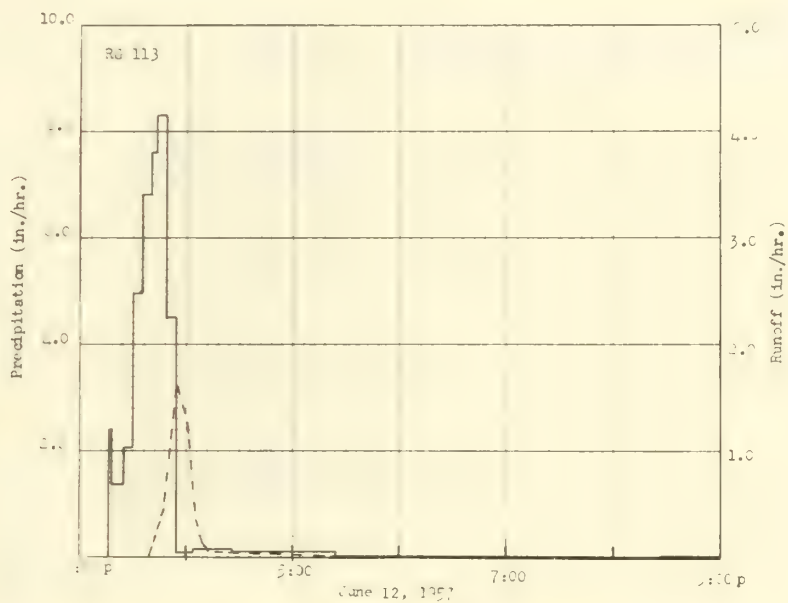
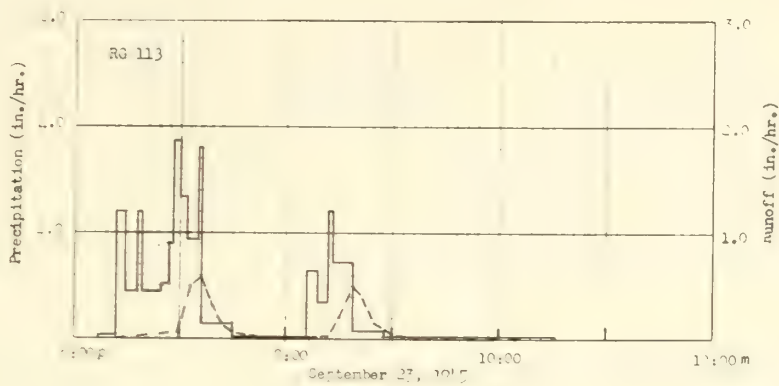


COSHOCTON, OHIO  
WATERSHED III

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 121 (Area - 1.42 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	1.11 0	5.36 .27	3.05 .10	3.68 .03	6.87 .17	1.50 .44	7.06 1.02	4.08 .04	1.17 0	1.10 0	1.11 0	2.77 T	42.82 2.07			
1957 P Q	1.11 .11	1.18 .01	1.48 0	1.36 .60	3.99 0	1.11 .88	3.85 .08	3.18 .03	4.29 .08	1.51 0	2.75 0	3.97 .05	41.74 1.77			
1958 P Q	1.27 .11	.70 0	.74 0	3.11 0	3.19 T	1.45 0	7.92 .01	3.11 .01	3.02 0	.36 0	1.79 0	.11 0	30.63 .13			
1959 P Q	5.71 1.03	3.11 .09	2.26 0	3.87 .02	2.72 0	1.80 .06	4.80 T	2.16 .07	2.73 .02	4.95 .01	2.73 0	2.07 0	12.21 1.30			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 121								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	1.62	6-12	0.37	6-28	0.38	6-28	0.11	6-28	0.11	6-28	0.16	6-28	0.18	6-3	0.57
1958	1-1	.16	1-21	.02	1-21	.02	1-21	.05	1-21	.06	1-21	.06	1-21	.06	1-21	.11
1959	1-21	.40		nr		nr		nr		nr		nr		nr		nr
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, corn; 1957, wheat; 1958, 1st year meadow; 1959, 2nd year meadow; conservation practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 121								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)						
Event of September 23, 1955																
9-23-55	T	0		9-23-55	mainage	113		9-23-55								
9-24	.06	0		6:14	.06	0		6:21 p	0	0						
9-25-31	0	0		:20	.06	.01		:55	.0692	.01						
9-1	.17	0		:20	2.40	.17		7:00	.146	.02						
9-2-7	0	0		:36	.70	.29		:06	.497	.05						
9-8	.76	T		:38	2.40	.37		:12	.592	.10						
9-9	.96	T		:50	.90	.55		:18	.364	.15						
9-10	.72	0		:5	1.05	.62		:21	.146	.18						
9-11	.5	0		:56	1.80	.68		:30	.0824	.19						
9-12	0	0		7:00	3.75	.93		:44	.0208	.20						
9-13	.29	0		:08	2.70	1.11		:00	.0002	.20						
9-14	1.20	0		:10	1.90	1.30		:24	.0325	.21						
9-15-16	0	0		:12	3.60	1.72		:30	.207	.22						
9-17	.50	0		:30	.33	1.52		:38	.497	.27						
9-18	1.01	T		8:12	.03	1.54		:42	.127	.30						
9-19	0	0		:15	1.30	1.67		:50	.165	.33						
9-20	.14	0		:23	.72	1.73		9:00	.0631	.35						
9-21-22	0	0		:26	2.10	1.85		:10	.0244	.36						
9-23	.691	0		:38	1.45	2.18		:20	.0140	.36						
				:50	.17	2.19		12:00m	.0013	.36						
				10:32	.06	2.28										
				12:00m	.01	2.29										
watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice, since 1942. Cover wheat to meadow in 1945. Grass and legumes 7" high. Seeds 15" high.																
Notes: To convert runoff in in/hr to cfs, multiply by 1.4312. 1/ Most of rain occurred after 4:14p.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 121		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 12, 1957</u>								
5-13-57	0	0	6-12-57	Rainage	113	6-12-57		
5-14	1.46	0	3:16p	0	0	3:39p	0	0
5-15	.04	0	:18	2.40	.08	:44	.254	.01
5-16-17	0	0	:25	1.37	.24	:47	.462	.03
			:30	2.04	.41	:55	1.62	.16
5-18	.15	0	:34	4.95	.74	:59	1.35	.26
5-19	.25	0	:40	6.80	1.42	4:05	.395	.34
5-20	.19	0	:43	7.60	1.80	:09	.146	.35
5-21	0	0	:49	4.30	2.63	:13	.0573	.36
5-22	.50	0	:55	4.50	3.08	5:27	0	.37
5-23-25	0	0	4:04	.07	3.09			
5-26	.12	0	:26	.14	3.14			
5-27-31	0	0	5:24	.10	3.24			
6-1	.12	0	8:26	.01	3.28			
6-2-7	0	0	9:24	.02	3.30			
6-8	.81	0						
6-9-10	0	0						
6-11	.35	0						
6-12	0	0						
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1942. Wheat in 1957. Wheat 30" high, weeds 14" high.								
<u>Event of June 28, 1957</u>								
5-28-31-57	0	0	6-28-57	Rainage	113	6-28-57		
6-1	.12	0	1:03p	0	0	4:34p	0	0
6-2-7	0	0	:07	3.45	.23	5:30	.0208	.01
6-8	.81	0	:39	.02	.24	6:04	.0518	.04
6-9-10	0	0	:44	1.32	.35	:12	.0824	.05
6-11	.35	0	2:01	.04	.36	:26	.146	.07
6-12	3.30	.37	:06	.60	.41	:42	.129	.11
6-13	.38	0	:35	.06	.44	:48	.146	.12
6-14	.04	0	:51	.26	.51	7:00	.936	.21
6-15-22	0	0	:56	1.08	.60	:06	.573	.29
6-23	.10	0	4:24	.07	.70	:12	.306	.33
6-24	2.32	.03	:29	1.32	.81	:30	.120	.39
6-25-27	0	0	5:17	.21	.98	8:00	.0416	.42
6-28	.12 1/2	0	:29	.55	1.09	12:00m	.0003	.44
			:33	1.05	1.16			
			:53	.45	1.31			
			:59	.90	1.40			
			6:07	.38	1.45			
			:13	1.50	1.60			
			:33	.60	1.80			
			:41	1.05	1.94			
			:50	2.87	2.37			
			7:04	.86	2.57			
			:45	.26	2.75			
			8:05	.06	2.77			
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1942. Wheat in 1957. Wheat 36" high, weeds 4" high.								
Notes: No tabulation for January 21, 1959 event due to faulty record.								
See map of watershed on page 26.20-5. 1/ Rain ended about 7:30a.								



ASHOTON, OHIO WATERSHED 121



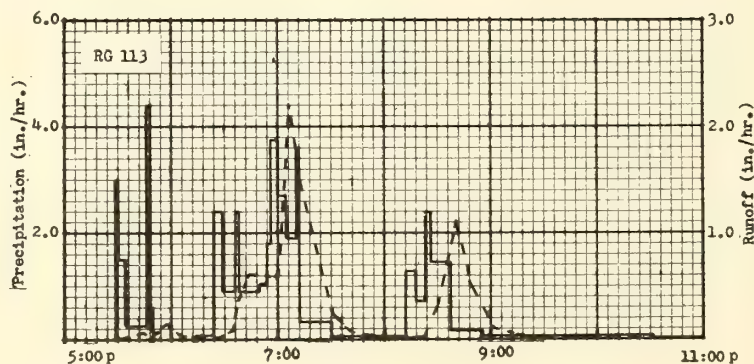
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 106 (Area - 1.56 acres)								
Month Year		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.41	5.36	3.05	3.68	6.87	4.56	7.06	4.08	1.47	1.10	1.41	2.77	42.82		
	Q	.05	.70	.03	T	.15	.79	2.08	.58	.05	0	0	.03	4.46		
1957	P	1.44	1.18	1.48	4.36	3.99	10.41	3.85	2.48	4.29	1.54	2.75	3.97	41.74		
	Q	.11	.02	.03	.52	.01	1.77	.10	.25	.18	0	.01	.75	3.75		
1958	P	1.27	.70	.74	3.44	3.19	4.65	7.92	3.11	3.02	.36	1.79	.44	30.63		
	Q	.76	.17	0	.02	.13	0	.19	.05	T	0	0	0	1.32		
1959	P	5.71	3.11	2.26	3.87	2.72	4.80	4.80	2.46	2.73	4.95	2.73	2.07	42.21		
	Q	1.05	.12	0	.02	0	.10	.01	.12	0	.04	.18	.24	1.88		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 106								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	3.03	6-12	0.93	6-12	0.94	6-12	0.94	6-12	0.94	6-12	0.95	6-12	0.95	6-8	0.96
1958	7-31	.22	1-21	.08	1-21	.17	1-21	.33	1-21	.39	1-21	.41	1-21	.41	1-21	.76
1959	1-21	.45	1-21	.28	1-21	.38	1-21	.71	1-20	.91	1-20	1.03	1-20	1.03	1-20	1.03
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, corn; 1957, wheat; 1958, 1st year meadow; 1959, 2nd year meadow; prevailing practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 106								
Antecedent conditions			Rainfall					Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Raingage	113	9-23-45	0	0								
8-24	.06	0	5:28p	0	0	5:30p	0	0								
8-25-31	0	0	:30	3.00	.10	:34	.0077	T								
9-1	.17	0	:34	1.50	.20	:44	.0750	.01								
9-2-7	0	0	:46	.25	.25	:50	.0379	.02								
9-8	.76	T	:48	4.20	.39	:52	.0814	.02								
9-9	.96	.07	:50	.60	.41	:57	.0150	.03								
9-10	.72	.01	6:14	0	.41	6:00	.117	.03								
9-11	.04	0	:24	.06	.42	:04	.0522	.04								
9-12	0	0	:28	2.40	.58	:26	.0057	.05								
9-13	.29	0	:36	.90	.70	:34	.0947	.05								
9-14	1.20	.15	:38	2.40	.78	:38	.360	.07								
9-15-16	0	0	:50	.90	.96	:44	.615	.12								
9-17	.50	0	:54	1.05	1.03	7:00	.595	.24								
9-18	1.01	.07	:56	1.80	1.09	:06	2.21	.39								
9-19	0	0	7:00	3.75	1.34	:12	1.51	.58								
9-20	.49	.06	:04	2.70	1.52	:24	.557	.80								
9-21-22	0	0	:10	1.90	1.71	:32	.231	.85								
9-23	.28 1/2	0	:12	3.60	1.83	:40	.0947	.87								
			:30	.33	1.93	:54	.0336	.88								
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing practice) since 1942. Cover wheat to meadow in 1945. Grass and clovers 8" high; weeds 12-18" high.																
			8:12	.03	1.95	8:10	.0189	.89								
			:18	1.30	2.08	:16	.0157	.89								
			:23	.72	2.14	:22	.0472	.90								
			:26	2.40	2.26	:30	.331	.91								
			:38	1.45	2.55	:40	1.11	1.05								
			:56	.17	2.60	:48	.521	1.16								
			10:32	.06	2.69	9:02	.102	1.21								
			12:00 m	.01	2.70	:18	.0336	1.23								
						:30	.0223	1.24								
						10:10	.0127	1.25								
						12:00m	.0039	1.26								
Notes: To convert runoff in in/hr to cfs, multiply by 1.5730. 1/ Most of rainfall occurred after 3:28p.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 106		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	0	0	6-12-57	Raingage	11.3	6-12-57		
5-14	1.46	.01	3:16p	0	0	3:28p	0	0
5-15	.34	0	:18	2.40	.08	:36	.231	.02
5-16-17	0	0	:25	1.37	.24	:53	3.03	.56
			:30	2.04	.41	:58	1.90	.77
5-18	.15	0	:34	.95	.74	4:02	.907	.86
5-19	.25	0	:40	6.80	1.42	:04	.521	.88
5-20	.19	0	:43	7.60	1.80	:16	.063	.92
5-21	0	0	:49	8.30	2.63	6:02	0	.94
5-22	.50	0	:55	1.50	3.08			
5-23-25	0	0	4:04	.07	3.09			
5-26	.12	0	:26	.14	3.14			
5-27-31	0	0	5:24	.10	3.24			
6-1	.12	0	8:26	.01	3.28			
6-2-7	0	0	9:24	.04	3.30			
6-8	.81	.01						
6-9-10	0	0						
6-11	.35	0						
6-12	0	0						
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing practice) since 1942. Cover wheat in 1957. Wheat 30" high, weeds 4" high.								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage	11.3	6-28-57		
6-1	.12	0	1:03p	0	0	2:53p	0	0
6-2-7	0	0	:07	3.45	.23	4:31	.0575	.01
6-8	.81	.01	:39	.02	.24	5:03	.0157	.03
6-9-10	0	0	:44	1.32	.35	6:03	.150	.10
6-11	.35	0	2:01	.04	.36	:19	.266	.15
6-12	3.30	.94	:06	.60	.41	:33	.220	.21
6-13	.38	.21	:35	.06	.44	:50	1.35	.37
6-14	.04	0	:51	.26	.51	7:03	.503	.60
6-15-22	0	0	:56	1.08	.60	:13	.266	.63
6-23	.10	0	4:24	.07	.70	:45	.0630	.70
6-24	2.32	.09	:29	1.32	.81	8:03	.0336	.71
6-25-27	0	0	5:17	.21	.98	11:33	0	.73
6-28	.12 1/2	0	:29	.55	1.09			
			:33	1.05	1.16			
			:53	.45	1.31			
			:59	.90	1.40			
			6:07	.38	1.45			
			:13	1.50	1.60			
			:33	.60	1.80			
			:41	1.05	1.94			
			:50	2.87	2.37			
			7:04	.86	2.57			
			:45	.26	2.75			
			8:05	.06	2.77			
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing practice) since 1942. Wheat in 1957. Wheat 36" high, weeds 4" high.								
Notes: 1/2 Rain ended about 7:00a.								

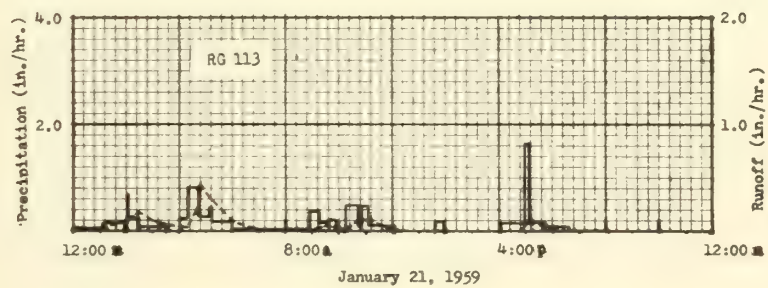
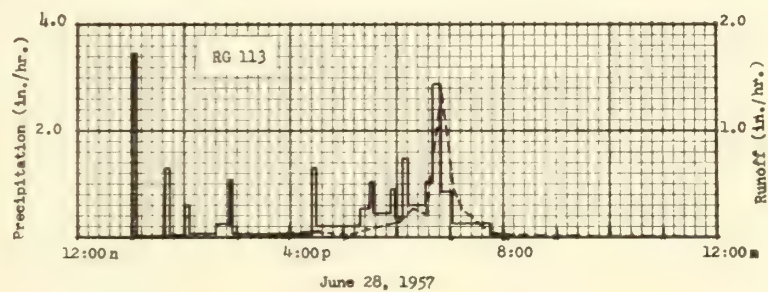
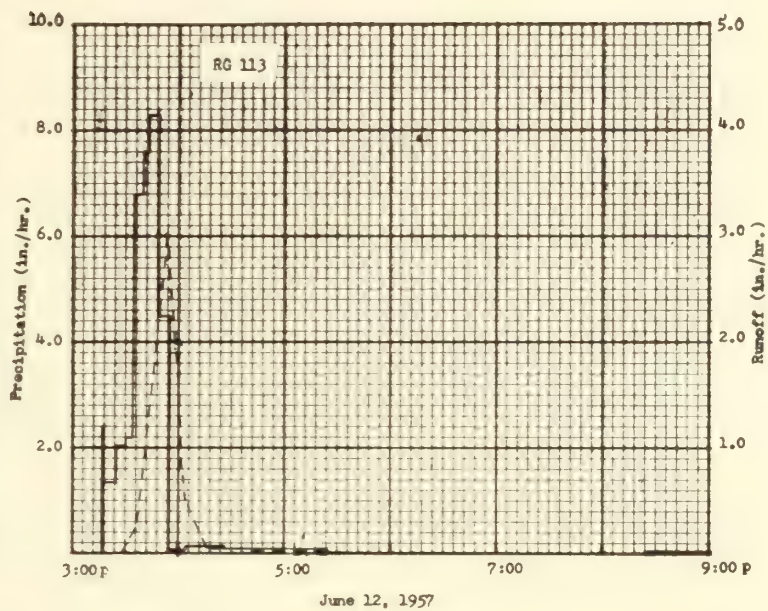
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 106		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Rain gauge	113	1-21-59		
12-23	T	0	12:01a	0	0	12:01a	0.0223	0
12-24	T 1/	0	1:06	.06	.07	1:05	.0424	.03
12-25-31	0	0	1:56	.16	.20	1:59	.102	.09
1-1-59	.60	.01	2:00	0	.20	2:29	.188	.17
1-2-3	0	0	1:06	.70	.27	1:59	.102	.24
1-4	.02 1/	0	1:30	.25	.37	3:47	.0630	.31
1-5-8	0	0	3:30	.09	.46	4:17	.0472	.33
1-9-10	T 1/	0	1:58	0	.46	1:39	.231	.37
1-11-13	0	0	4:19	.26	.55	1:47	.452	.42
1-14	.29	0	1:42	.83	.87	5:11	.306	.56
1-15	.71 2/	0	5:06	.28	.98	6:01	.102	.70
1-16-19	.30 1/	0	1:14	.45	1.04	7:11	0	.73
1-20	.43	.05	1:58	.19	1.18	8:45	0	.73
			8:55	.06	1.37	9:31	.0472	.76
			9:15	.39	1.50	10:15	.0189	.78
			1:37	.14	1.55	1:45	.117	.81
			1:54	.21	1.61	11:01	.102	.84
			10:14	.03	1.62	1:07	.133	.85
			1:13	.50	1.86	1:51	.0336	.91
			1:50	.09	1.87	12:21p	0	.91
			11:06	.49	2.00	4:51	0	.91
			12:06p	.10	2.10	5:11	.117	.92
			1:36	0	2.10	1:45	.0336	.96
			1:54	.20	2.16	6:23	.0077	.98
			4:02	0	2.16			
			1:59	.16	2.31	7:05	0	.98
			5:10	1.64	2.61			
			1:46	.17	2.71			
			6:38	.10	2.80			
			8:06	.01	2.82			
Watershed conditions: In corn, wheat, meadow, meadow rotation since 1942. In second year meadow in 1959. Vegetation dormant. Frost penetration 1". Snow cover 5" on January 20. (Prevailing practice)								

Notes: 1/ Snow  
2/ Rain and Snow



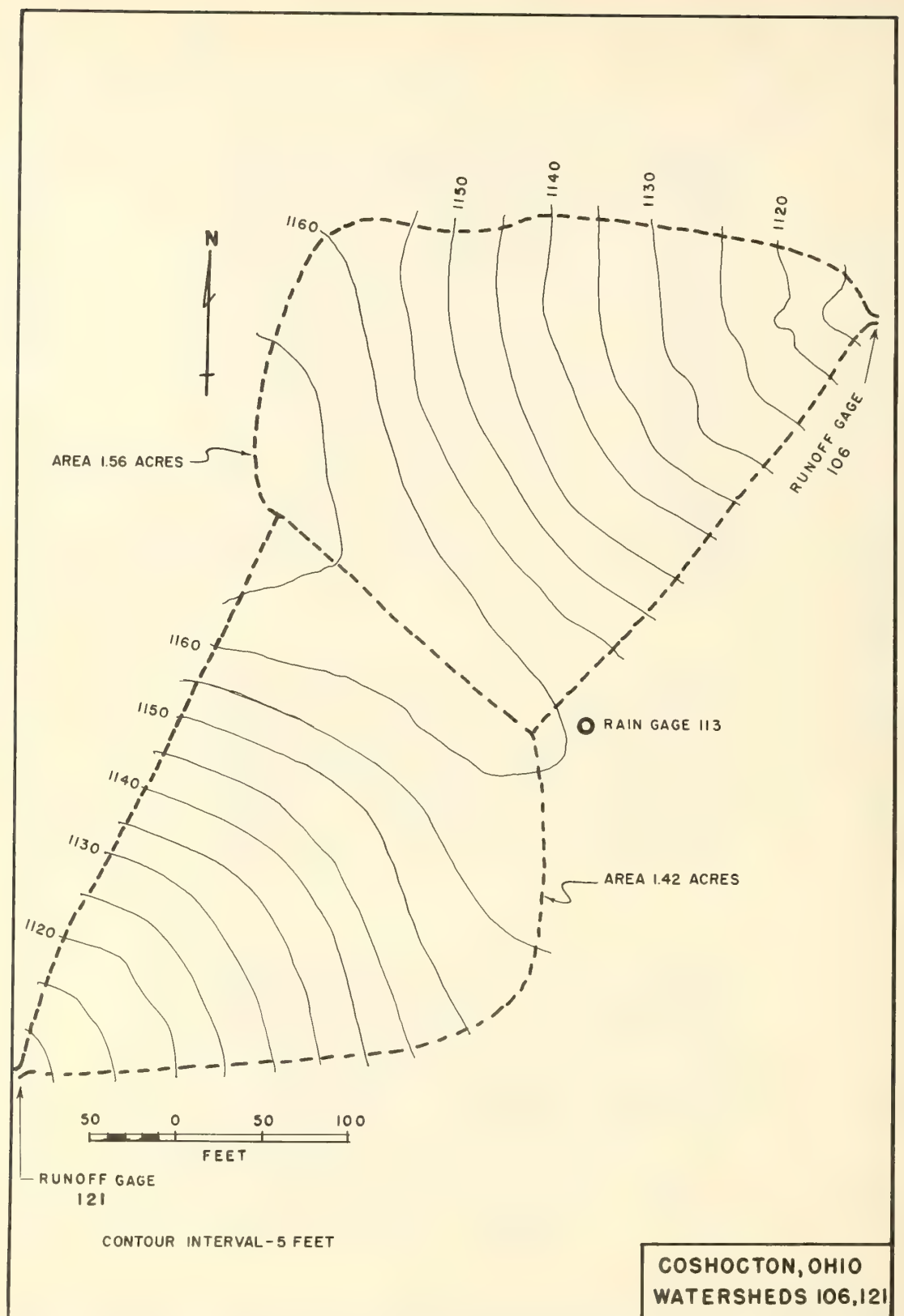
September 23, 1945

COSHOCTON, OHIO WATERSHED 106



COSHOCTON, OHIO    WATERSHED 106

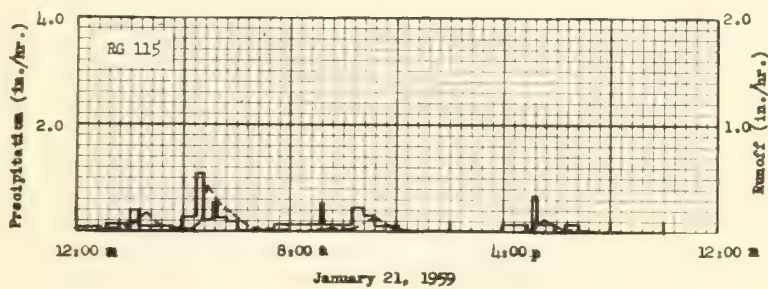
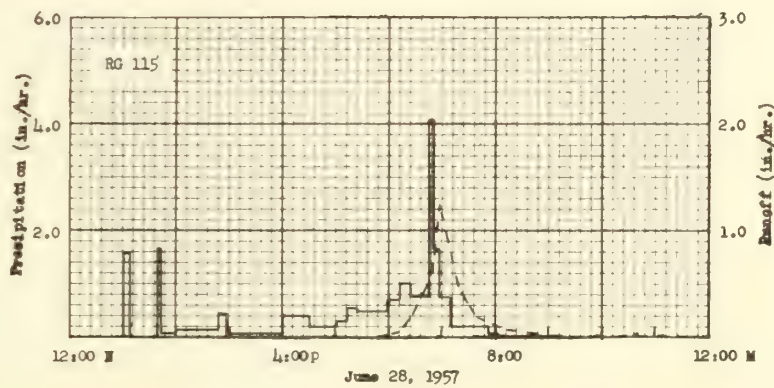
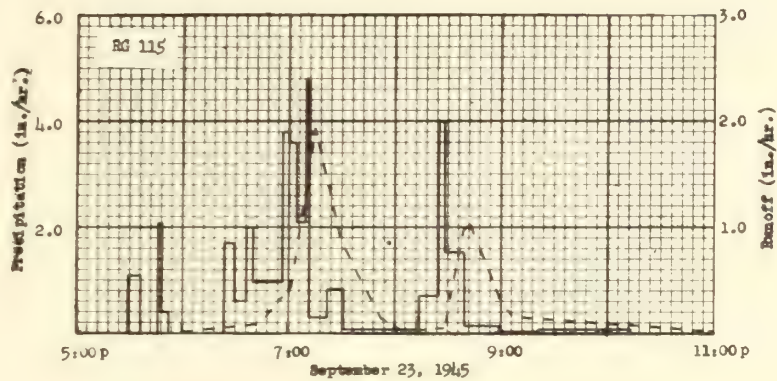




MONTHLY PRECIPITATION AND RUNOFF (Inches)									Cosmos, Ohio Watershed 188 (Area - 2.05 acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.51	5.61	3.20	3.80	7.03	4.13	6.99	4.63	1.46	1.12	1.35	3.02	43.85		
	Q	0	.81	.08	0	.06	.04	.35	0	0	0	0	0	1.31		
1957	P	1.53	1.25	1.54	1.41	4.23	9.94	3.79	2.72	4.45	1.51	2.80	4.08	40.25		
	T	0	0	0	.15	0	1.73	0	.03	.05	0	0	.02	1.98		
1958	P	1.39	.77	.81	3.51	3.24	4.46	7.46	3.02	3.16	.30	1.92	.49	30.51		
	T	.15	0	0	0	.05	0	.01	0	0	0	0	0	.21		
1959	P	5.58	3.10	2.39	3.99	3.05	4.75	4.43	2.35	2.69	5.05	2.64	1.96	42.38		
	Q	.92	.19	0	0	T	.16	0	.1	0	0	0	0	1.11		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS									Cosmos, Ohio Watershed 188							
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	e2.50		nr		nr		nr		nr	6-12	e0.88	6-12	e0.88	6-12	e 0.88
1958	7-22	.34	1-24	.03	1-24	.05	1-24	.09	1-24	.09	1-24	.09	1-24	.09	1-21	.15
1959	6-12	.46	1-21	.28	1-21	.38	1-21	.45	1-21	.81	1-21	.92	1-21	.92	1-21	.92
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, corn; 1957, wheat; 1958, 1st year meadow; 1959, 2nd year meadow; conservation practice plus mulch tillage.																
SELECTED RUNOFF EVENTS									Cosmos, Ohio Watershed 188							
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	0.01	0	8-23-45	Range	115	9-23-45										
8-24	.08	0	5:29 p	0	0	5:59 p	0	0								
8-25-31	0	0	:37	1.12	.15	6:44	.0934	.01								
9-1	.15	0	:45	0	.15	7:01	.432	.10								
9-2-7	0	0	:49	2.10	.29	:15	1.95	.37								
9-8	.82	0	:52	.40	.31	:30	.885	.71								
9-9	.88	0	6:24	0	.31	:53	.135	.89								
9-10	.70	0	:30	1.70	.48	8:03	.0112	.91								
9-11	.05	0	:37	.60	.55	:11	.0168	.91								
9-12	0	0	:40	2.00	.65	:29	.0498	.92								
9-13	.30	0	:57	.95	.92	:34	.797	1.00								
9-14	1.21	.06	7:00	3.80	1.11	:43	1.04	1.07								
9-15-16	0	0	:04	3.60	1.35	9:00	.337	1.27								
9-17	.53	0	:10	2.10	1.56	:07	.177	1.30								
9-18	1.04	.02	:12	4.00	1.72	12:00m	.0003	1.33								
9-19	0	0	:22	.30	1.77											
9-20	.3	T	:32	.84	1.91											
9-21-22	0	0	8:14	.07	1.96											
9-23	.34 1/	0	:25	.71	2.09											
			:28	4.00	2.29											
Watershed conditions: In			:40	1.55	2.60											
corn, wheat, meadow, meadow			9:00	.18	2.66											
rotation (conservation practice with mulch tillage) since			:22	.05	2.68											
1942. Cover wheat to meadow			10:14	.09	2.76											
1945. Legumes and grass 7" high; weeds 12-20" high.																
Notes: To convert runoff in in/hr to cfs, multiply by 2.0671. 1/ Most of rain occurred after 3:29p.																

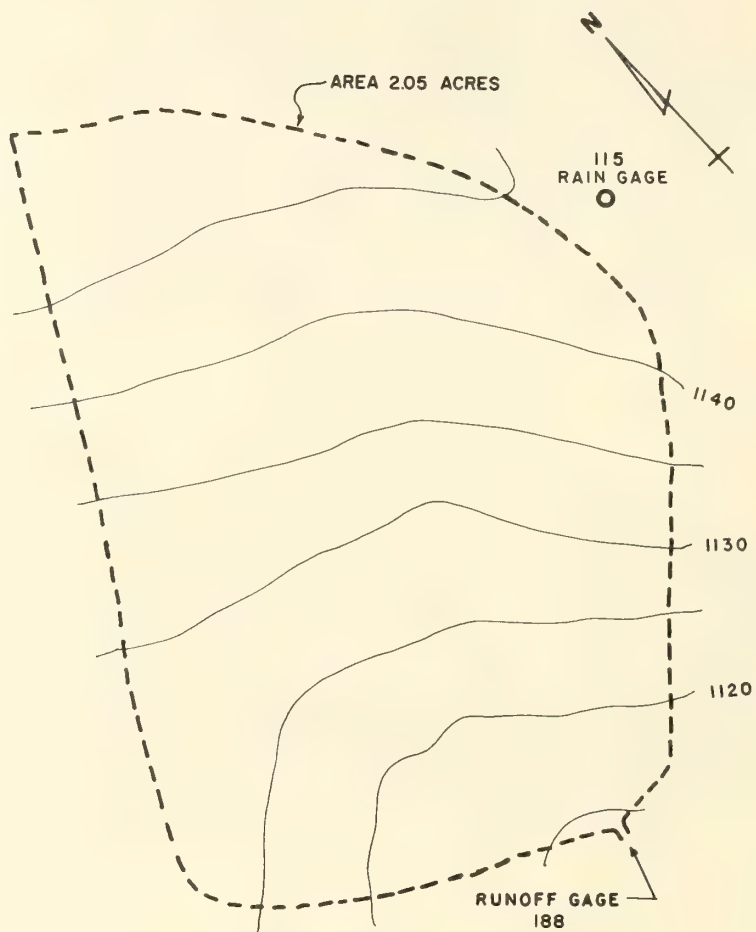
Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 188		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 28, 1957</u>								
5-28-31-57	0	0	6-28-57	Raingage	115	6-21-57		
6-1	.06	0	1:00p	0	0	5:46p	0	0
6-2-7	0	0	:08	1.58	.21	6:12	.0648	.01
6-8	.88	0	:38	0	.21	:24	.195	.04
6-9-10	0	0	:43	1.68	.35	:48	.590	.16
6-11	.35	0	2:00	.04	.36	:56	1.25	.29
6-12	2.87	e .88	:48	.14	.47	7:16	.590	.61
6-13	.35	0	:56	.45	.53	:22	.432	.66
6-14	.02	0	4:00	.05	.58	:40	.195	.75
6-15	0	0	:30	.40	.78	8:12	.0701	.82
6-16	.02	0	5:00	.20	.88	9:02	.0113	.84
6-17-22	0	0	:12	.30	.94	11:42	0	.85
6-23	.08	0	:24	.55	1.05			
6-24	2.28	0	:58	.51	1.34			
6-25-27	0	0	6:12	.69	1.50			
6-28	.18 2/	0	:24	1.00	1.70			
			:44	.78	1.96			
			:49	1.08	2.30			
			:56	1.63	2.49			
			7:08	.75	2.64			
			:52	.20	2.79			
			8:04	.05	2.80			
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice with mulch tillage) since 1942. Wheat in 1957. Wheat 36" high, weeds 4" high.								
<u>Event of January 21, 1959</u>								
12-21-22-58	0	0	1-21-59	Raingage	115	1-21-59		
12-23	T	0	12:01a	0	0	12:49a	0	0
12-24	T 1/	0	:55	.08	.07	1:15	.0139	T
12-25-31	0	0	1:03	0	.07	:35	.0412	.01
1-1-59	.64	0	:55	.15	.20	2:05	.0755	.04
			:59	0	.20	:25	.143	.08
1-2-3	0	0	2:18	.41	.33	:35	.168	.10
1-4	.04 1/	0	3:31	.11	.46	3:05	.0648	.16
1-5-8	0	0	:55	0	.46	4:19	.0197	.20
1-9-10	T 1/	0	4:31	.27	.62	:39	.1001	.22
1-11-13	0	0	:44	1.11	.86	:47	.300	.24
1-14	.31	0	5:04	.21	.93	:53	.432	.28
1-15	.59 2/	0	:15	.55	1.03	5:25	.255	.46
1-16-19	.30 1/	0	:38	.26	1.13	6:05	.120	.56
1-20	.44	0	6:03	.19	1.21	:35	.0371	.60
			7:23	.01	1.22	8:35	.0003	.61
			9:07	.13	1.44	9:31	.0412	.62
			:15	.52	1.51	10:15	.0295	.65
			10:15	.13	1.64	:45	.0876	.68
			:45	.46	1.87	11:15	.143	.73
			11:11	.32	2.01	:47	.0547	.79
			12:03p	.10	2.10	1:05p	0	.81
			3:59	.02	2.19	4:52	0	.81
			4:55	.16	2.34	5:12	.0498	.81
			5:02	0	2.34	:28	.128	.84
			:15	.69	2.49	6:12	.0412	.89
			:55	.15	2.59	8:02	0	.92
			6:15	0	2.59			
			:49	.16	2.68			
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice with mulch tillage) since 1942. Second year meadow in 1959. Vegetation dormant. Frost penetration 1". Snow cover 5" on Jan. 20.								
Notes: No record for June 12, 1957 storm on Watershed 188.								
1/ Snow      2/ Rain and Snow      2/ Rainfall ended about 7:30a.								



COSHOCTON, OHIO WATERSHED 188





CONTOUR INTERVAL-5 FEET

COSHOCTON, OHIO  
WATERSHED 188

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 124 (Area - 2.07 acres)					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Burst of September 23, 1945</u>								
8-23-45	T	0	9-23-45	Rainage	108	9-23-45		
8-24	.06	0	5:27p	0	0	5:30p	0	0
8-25-31	0	0	1:31	3.30	.22	5:50	.0824	.01
9-1	.18	0	1:36	2.16	.40	5:54	.120	.01
9-2-7	0	0	1:47	.16	.43	5:57	.113	.02
9-8	.84	0	1:49	3.90	.56	6:02	.142	.03
9-9	.92	0	1:54	.60	.61	6:09	.0824	.04
9-10	.79	0	6:16	0	.61	6:30	.0195	.06
9-11	.03	0	1:25	.07	.62	6:40	.0433	.06
9-12	0	0	1:30	1.32	.73	7:00	.229	.11
9-13	.29	0	1:34	.90	.79	7:11	1.16	.22
9-14	1.29	.06	1:40	1.80	.97	7:18	1.43	.36
9-15-16	0	0	1:52	.80	1.13	7:24	1.02	.49
9-17	.53	0	7:00	1.88	1.38	7:30	.541	.57
9-18	1.04	.04	7:02	5.40	1.56	7:40	.293	.63
9-19	0	0	1:06	3.00	1.76	8:00	.0824	.69
9-20	.57	.02	1:12	2.10	1.97	8:18	.0393	.71
9-21-22	0	0	1:32	.42	2.11	8:22	.0517	.71
9-23	.29 $\frac{1}{2}$	0	1:40	.15	2.13	8:28	.120	.72
			8:10	.04	2.15	8:32	.260	.73
			1:20	.60	2.25	8:36	.434	.75
			1:28	1.28	2.42	8:42	.795	.81
			1:40	1.45	2.71	8:54	.148	.96
			9:02	.16	2.77	9:00	.260	.99
			10:50	.06	2.88	9:30	.0517	1.05
						10:00	.0320	1.07
						12:00m	.0029	1.09

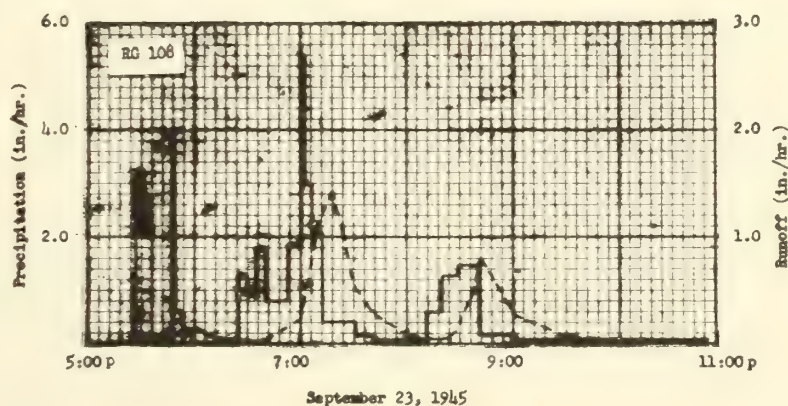
Watershed conditions

Contour strips of meadow and corn. Height of corn 108"; weeds 42", grass 12". In corn strips. Meadow strips, grass and legumes 6" high. In contour strips of corn and meadow (1941), wheat and meadow (1942) and continuing in strips of corn, wheat, meadow, meadow for period 1941-45.

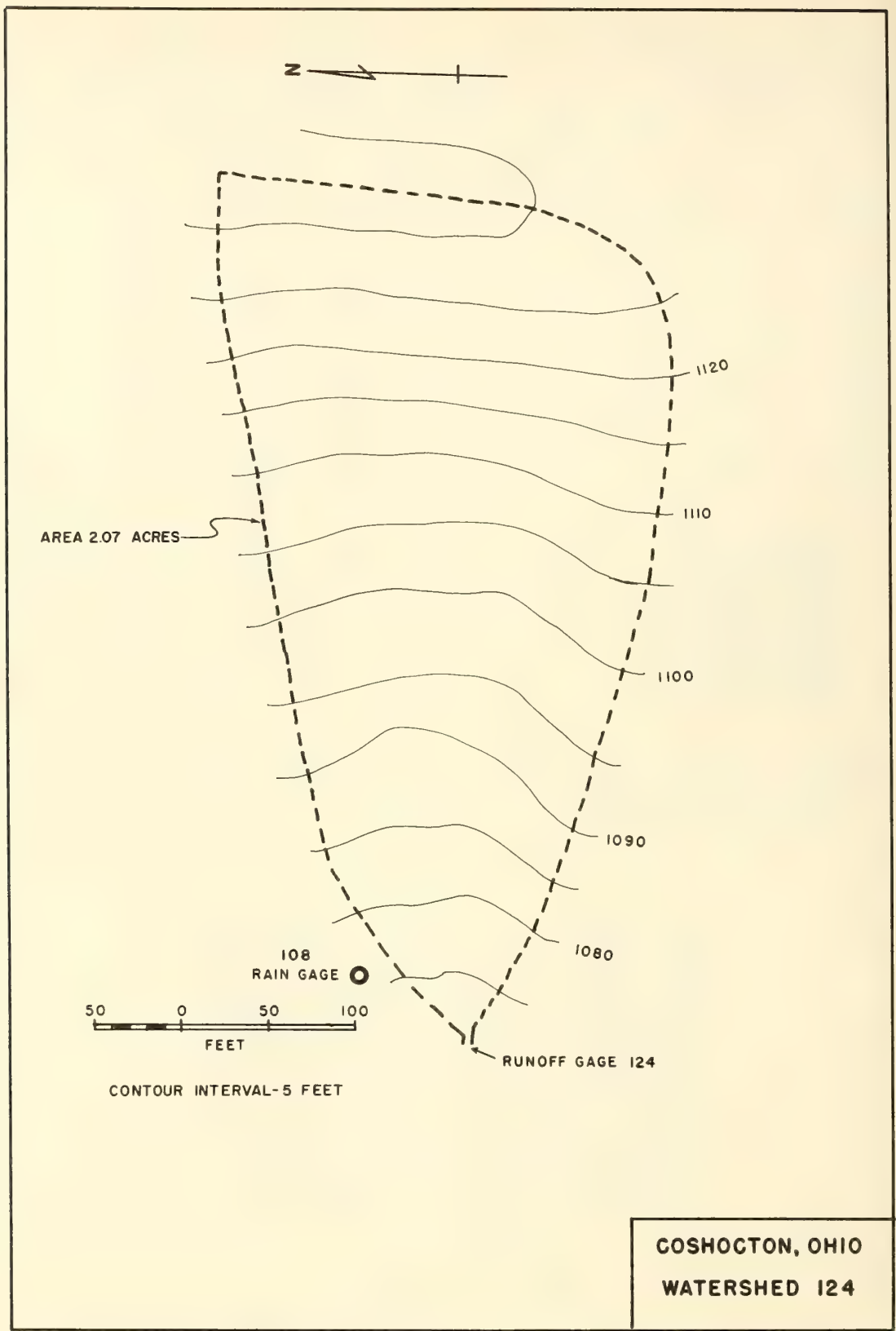
Notes: Records discontinued June 30, 1947.

To convert runoff in in/hr to cfs, multiply by 2.0872.

$\frac{1}{2}$  Most of rainfall occurred after 3:27p.



COSHOCTON, OHIO      WATERSHED 124



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 185 (Area 7.40 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P G	1.52 .14	5.48 .96	3.24 .07	3.85 T	6.99 .15	4.22 .18	6.95 1.02	4.33 .09	1.49 T	1.17 0	1.34 0	2.97 0	43.55 2.61			
1957 P G	1.54 T	1.23 0	1.73 0	4.84 .86	4.19 T	9.83 1.48	3.67 .02	2.65 .09	4.24 .15	1.45 0	2.83 0	4.01 .16	42.21 2.76			
1958 P G	1.51 .14	.75 0	.88 0	3.45 0	3.17 .05	4.65 0	7.45 .29	3.03 T	3.23 0	.34 0	1.88 0	.66 0	31.00 .48			
1959 P G	5.38 .83	2.34 .16	2.26 T	4.44 .02	2.08 0	1.40 .03	1.74 0	2.37 .05	2.66 0	4.95 0	2.46 T	1.89 .03	40.02 1.12			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 185								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	2.65	6-12	0.69	6-12	0.70	6-28	0.74	6-28	0.74	6-28	0.74	6-28	0.74	4-3	e 0.85
1958	7-31	.24	7-22	.09	7-22	.10	7-22	.13	7-22	.13	7-22	.13	7-22	.13	7-22	.13
1959	1-21	.23	1-21	.19	1-21	.27	1-21	.36	1-21	.65	1-21	.83	1-21	.83	1-21	.83
Notes: Quality of records: monthly P, excellent; G, good; annual maximum discharges and volumes, good. Cover 1956, meadow and corn; 1957, meadow and wheat; 1958, corn and meadow; 1959, wheat and meadow; conservation practice with strip cropping.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 185								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	0.01	0	9-23-45	Rain gauge	128	9-23-45										
8-24	.07	0	5:29p	0	0	5:46p	0	0								
8-25-31	0	0	:32	1.00	.20	6:00	.0468	0								
9-1	.16	0	:40	.60	.28	:06	.0468	.01								
9-2-7	0	0	:46	0	.28	:28	.0089	.02								
9-8	.85	T	:48	4.20	.42	:42	.158	.03								
9-9	.94	.03	:52	.60	.46	7:00	.554	.13								
9-10	.74	.01	6:11	0	.46	:08	1.90	.30								
9-11	.04	0	:16	.30	.47	:24	.524	.67								
9-12	0	0	:24	0	.47	:30	.300	.71								
9-13	.32	0	:30	1.70	.64	:54	.0576	.77								
9-14	1.23	.10	:39	1.13	.81	8:12	.0174	.78								
9-15-16	0	0	:54	.88	1.03	:24	.0244	.78								
9-17	.54	0	:58	2.40	1.19	:30	.554	.80								
9-18	1.06	.04	7:00	4.20	1.33	:38	1.05	.93								
9-19	0	0	:05	3.00	1.58	:44	.477	1.06								
9-20	.41	.02	:09	1.20	1.66	9:00	.173	1.12								
9-21-22	0	0	:12	3.40	1.83	:12	.0730	1.14								
9-23	.33 1/	0	:32	.15	1.98	:18	.0493	1.15								
			:50	.07	2.00	10:00	.0143	1.17								
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice) since 1942. Meadow in 1945. Alfalfa 12" high, grass 5" high, weeds 12" high.			8:07	0	2.00	12:00m	.0014	1.18								
			:10	.20	2.01											
			:15	0	2.01											
			:20	1.08	2.10											
			:26	.70	2.17											
			:28	5.10	2.34											
			:40	1.55	2.65											
			:54	.17	2.69											
			9:22	.04	2.71											
			10:00	.09	2.77											
Notes: To convert runoff in in/hr to cfs, multiply by 7.4616. 1/ Most of rainfall occurred after 3:29p.																

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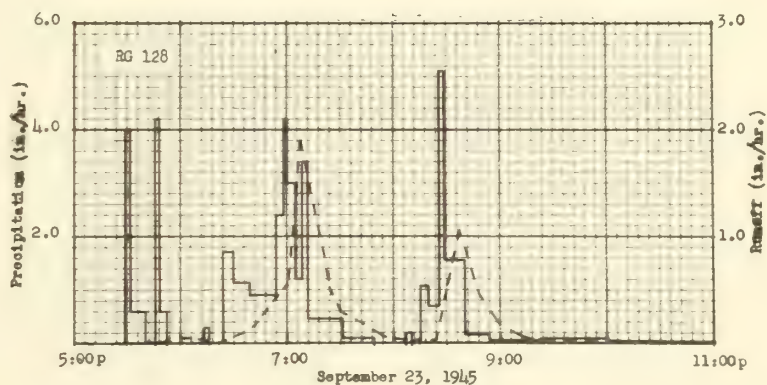
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 185		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	0	0	6-12-57	Rainage	128	6-12-57		
5-14	1.60	T	3:14p	0	0	3:40p	0	0
5-15	.04	0	:16	3.30	.11	:49	.260	.01
5-16-17	0	0	:26	.78	.24	:54	1.58	.08
			:43	3.21	1.15	4:00	2.65	.30
5-18	.18	0	:48	6.36	1.68	:04	2.20	.47
5-19	.26	0	:53	6.24	2.20	:12	.477	.64
5-20	.14	0	:59	5.00	2.70	:14	.328	.65
5-21	0	0	4:16	.11	2.73	:16	.260	.66
5-22	.52	0	:28	.15	2.76	5:38	0	.70
5-23-25	0	0	:52	.22	2.85			
5-26	.18	0						
5-27-31	0	0						
6-1	.10	0						
6-2-7	0	0						
6-8	.84	0						
6-9-10	0	0						
6-11	.35	0						
6-12	0	0						
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice with contour strips) since 1946. Wheat and meadow strips in 1957. Wheat 30" high, legumes and grass 4" high in wheat strips. Meadow strips, legumes, grasses and weeds 6" high.								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Rainage	128	6-28-57		
6-1	.10	0	1:03p	0	0	3:00p	0	0
6-2-7	0	0	:06	4.40	.22	5:44	.0576	.03
6-8	.84	0	:38	.02	.23	6:34	.260	.15
6-9-10	0	0	:42	2.25	.38	:38	.253	.17
6-11	.35	0	2:00	.03	.39	:56	1.31	.34
6-12	2.85	.70	:06	.10	.43	7:00	1.25	.43
6-13	.37	T	:48	.10	.50	:12	.477	.58
6-14	.02	0	:54	.90	.59	:24	.247	.65
6-15	0	0	4:22	.07	.70	8:04	.0468	.72
6-16	.02	0	:28	1.10	.81	11:08	0	.74
6-17-18	0	0	:44	.34	.90			
6-19	.02	0	5:12	.17	.98			
6-20-22	0	0	6:12	.53	1.51			
6-23	.11	0	:40	.61	1.89			
6-24	2.26	.04	:54	2.10	2.38			
6-25-27	0	0	7:11	.53	2.53			
6-28	.18 1/	0	:44	.20	2.64			
		0	8:00	.08	2.66			
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice with contour strips) since 1946. Wheat and meadow strips in 1957. Wheat 36" high, grass 4" high in wheat strips. Meadow strips, legumes, grass and weeds 8" high.								
Notes: 1/ Rain ended about 7:30a.								

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 185					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Raingage	128	1-21-58		
12-23	T 1/	0	12:01a	0	0	12:10a	0	0
12-24	T 1/	0	2:00	.10	.19	1:20	.0158	.01
12-25-31	0	0	2:28	.34	.35	2:00	.0442	.03
1-1-59	.68	0	4:08	.08	.48	3:30	.0903	.06
1-2-3	0	0	4:18	0	.48	3:00	.0548	.10
1-4	.02 2/	0	4:30	.50	.58	4:16	.0283	.15
1-5-8	0	0	4:44	1.07	.83	4:38	.105	.17
1-9-10	T 1/	0	5:09	.38	.99	5:00	.229	.25
1-11-13	0	0	6:04	.19	1.16	4:6	.105	.38
1-14	.32 2/	0	8:28	.03	1.23	6:30	.0324	.43
1-15	.50 2/	0	9:16	.26	1.44	8:30	.0102	.46
1-16-19	.30 1/	0	10:12	.10	1.53	9:20	.0468	.48
1-20	.45	0	11:08	.36	1.87	10:10	.0263	.51
			12:00m	.08	1.94	11:0	.0764	.53
			1:32p	0	1.94	11:10	.113	.58
			5:05	.06	2.17	11:6	.0520	.62
			1:13	1.28	2.34	1:30p	.0077	.66
			7:20	.10	2.55	5:6	.0158	.66
						3:40	.0045	.68
						5:08	.0698	.70
						4:4	.158	.71
						4:30	.0867	.74
						6:30	.0303	.79
						12:00m	0	.83

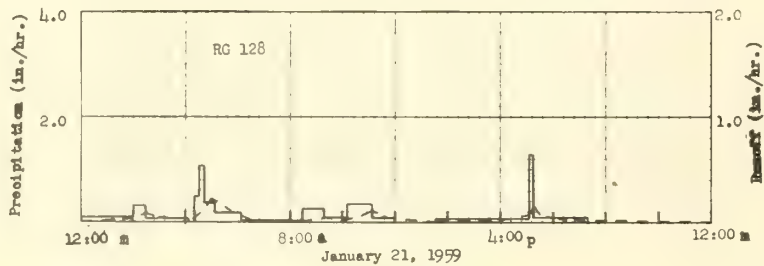
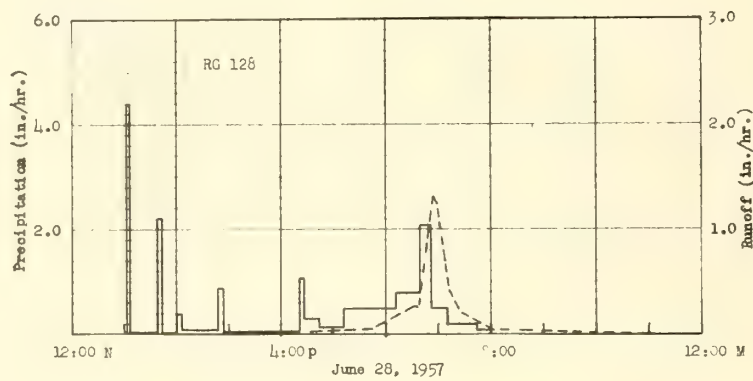
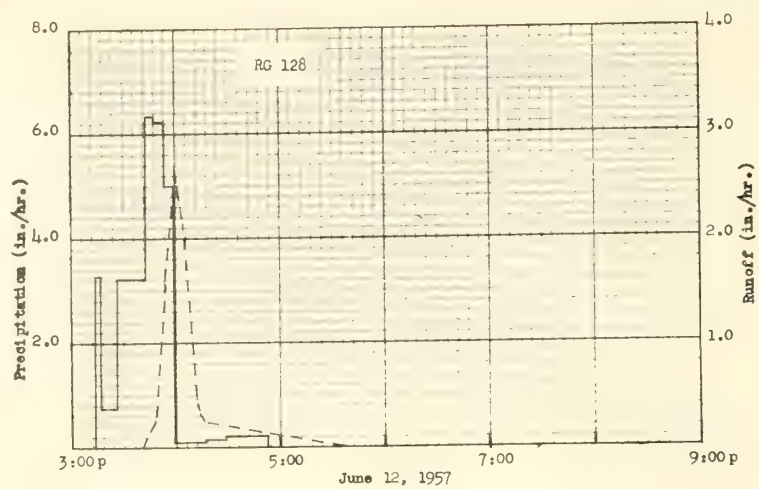
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice with contour strips) since 1946. Wheat and meadow strips in 1959. Vegetation dormant. Frost penetration on both wheat and meadow strips 1". Snow cover 5" on January 20.

Notes: 1/ Snow

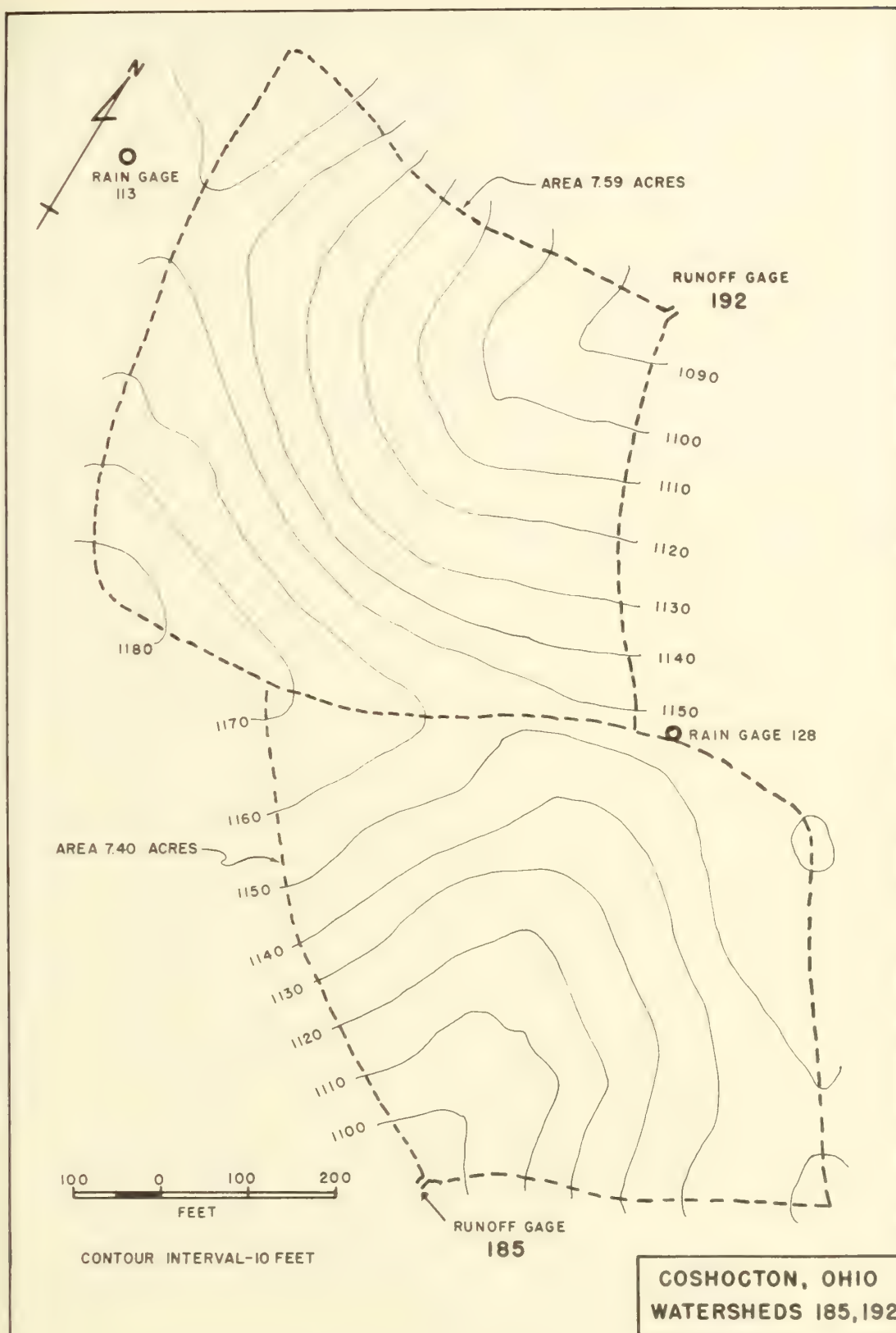
2/ Rain and Snow



COSHOCTON, OHIO WATERSHED 185



COSHOCTON, OHIO WATERSHED 185





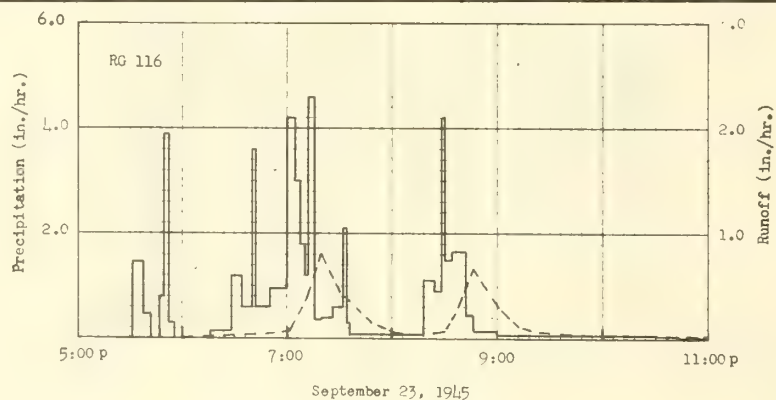
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 187 (Area - 7.20 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P	1.59	5.92	3.58	4.06	7.29	4.23	7.09	4.64	1.58	1.20	1.39	3.22	45.82			
Q	.14	1.58	.26	.07	.26	.16	.42	.07	T	0	0	T	2.97			
1957 P	1.54	1.33	1.79	4.81	4.27	10.00	3.81	2.84	4.48	1.47	2.57	3.49	42.40			
Q	.46	0	0	1.65	.02	2.16	.29	.13	.09	0	.01	.98	5.79			
1958 P	1.40	.66	.85	3.60	3.22	4.56	7.75	2.94	3.02	.30	2.09	.79	31.18			
Q	.25	.06	0	.01	.87	0	.08	.05	.01	0	0	0	1.33			
1959 P	5.26	2.63	2.52	3.95	2.94	4.71	4.85	2.34	2.74	5.17	2.82	2.09	42.02			
Q	3.42	.98	.37	.07	T	.07	.03	.09	0	.01	.03	.84	5.91			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 187								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	2.75	6-12	0.71	6-28	0.80	6-28	0.92	6-28	0.96	6-28	1.08	6-28	1.28	4-4	1.48
1958	7-31	.08	5-4	.04	5-4	.07	5-4	.12	5-4	.16	5-4	.24	5-4	.38	5-4	.87
1959	1-21	.35	1-21	.29	1-21	.45	1-21	.70	1-21	1.26	1-21	1.90	1-21	2.39	1-20	3.36
Notes: Quality of records: monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1956, meadow-wheat; 1957, corn-meadow; 1958, wheat-meadow; 1959, meadow-corn; conservation practice with strip cropping.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 187								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	0.01	0	9-23-45	Raingage	116	9-23-45										
8-24	.08	0	5:31p	0	0	6:00p	0	0								
8-25-31	0	0	:38	1.46	.17	:50	.0404	.01								
9-1	.18	0	:42	.45	.20	7:02	.0785	.02								
9-2-7	0	0	:47	0	.20	:12	.402	.05								
9-8	.92	0	:50	.80	.24	:20	.806	.14								
9-9	.92	0	:52	3.90	.37	:30	.455	.25								
9-10	.80	0	:56	.30	.39	:48	.157	.33								
9-11	.02	0				8:00	.0685	.35								
9-12	0	0	6:16	0	.39	:18	.0333	.37								
9-13	.31	0	:28	.15	.42	:30	.0751	.37								
9-14	1.34	.01	:34	1.20	.54	:36	.229	.39								
9-15-16	0	0	:40	.60	.60	:46	.675	.48								
9-17	.60	0	:42	3.60	.72	9:00	.309	.60								
9-18	1.07	.02	:50	.60	.80	:12	.125	.63								
9-19	0	0	7:00	.96	.96	:20	.0785	.65								
9-20	.51	T	:04	4.20	1.24	10:00	.0333	.68								
9-21-22	0	0	:08	3.00	1.44	:30	.0251	.69								
9-23	.36 1/2	0	:10	1.80	1.50	12:00m	.0132	.72								
			:12	1.20	1.54											
Watershed conditions: In corn, wheat, meadow, meadow rotation (conservation practice with contour strips) since 1944. Corn and meadow strips in 1945. Corn 10 3/4" high, weeds 6", grass 3 1/2" high in corn strips. Meadow strips legumes and grass 7", weeds 11" high.			:15	4.60	1.77											
			:20	.36	1.80											
			:26	.40	1.84											
			:32	.60	1.90											
			:34	2.10	1.97											
			:36	.30	1.98											
			8:18	.07	2.03											
			:24	1.10	2.44											
			:28	.90	2.20											
			:30	4.20	2.34											
Notes: To convert runoff in in/hr to cfs, multiply by 7.2601. 1/ Most of rainfall occurred after 3:31p.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station.

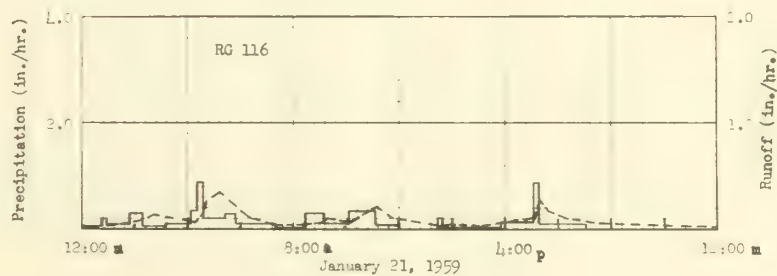
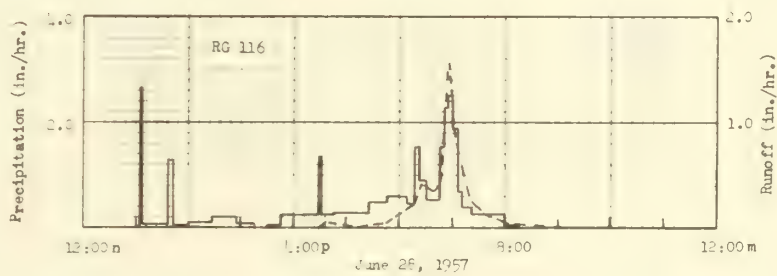
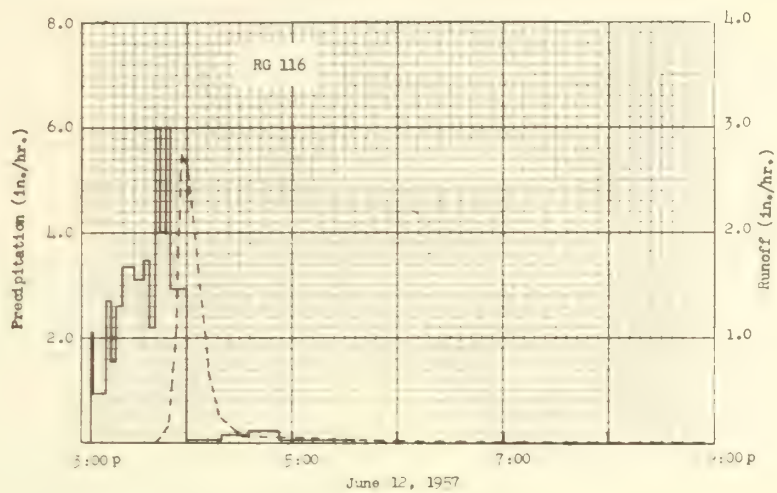
SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 187 (Area - 7.20 acres)					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of September 23, 1945 - Continued</u>								
			8:34p	1.50	2.14			
			:42	1.65	2.66			
			:46	.45	2.69			
			9:00	.13	2.72			
			10:30	.08	2.84			
			:43	.05	2.85			
			12:00m	.01	2.86			
<u>Event of June 12, 1957</u>								
5-13-57	0	0	6-12-57	Raingage	116	6-12-57		
5-14	1.75	.02	3:05p	0	0	3:43p	0	0
5-15	.08	0	:07	2.10	.07	:50	.153	.01
5-16-17	0	0	:11	.94	.18	:54	1.12	.05
			:16	2.70	.27	:57	2.75	.15
5-18	.11	0	:20	1.65	.38	4:00	2.63	.28
5-19	.26	0	:23	2.60	.51	:12	.722	.62
5-20	.18	0	:30	3.31	.90	:18	.267	.66
5-21	0	0	:35	3.12	1.16	:32	.0718	.69
5-22	.18	0	:39	3.45	1.39	5:52	.0117	.74
5-23-25	0	0	:12	2.20	1.50	9:00	.0022	.76
5-26	.15	0	:15	6.00	1.80			
5-27-31	0	0	:18	11.00	2.00			
6-1	.08	0	:51	6.00	2.30			
6-2-7	0	0	1:00	2.93	2.74			
6-8	.87	0	:20	.06	2.76			
6-9-10	0	0	:35	.16	2.80			
6-11	.30	0	:53	.23	2.87			
6-12	0	0	5:35	.04	2.90			
<u>Watershed conditions:</u> In corn, wheat, meadow, meadow rotation (conservation practice with contour strips) since 1941. Corn and meadow strips in 1957. Corn 20" high, weeds 10" high. Meadow strips, legumes, grass and weeds 7" high.								
<u>Event of June 28, 1957</u>								
5-28-31-57	0	0	6-28-57	Raingage	116	6-28-57		
6-1	.08	0	1:02p	0	0	1:39p	0	0
6-2-7	0	0	:07	2.64	.22	:51	.0104	T
6-8	.87	0	:37	.04	.21	2:35	.0004	T
6-9-10	0	0	:13	1.30	.37	4:31	.0118	.01
6-11	.30	0	2:00	.04	.38	:35	.0534	.01
6-12	2.90	.76	:25	.10	.12	5:05	.0132	.02
6-13	.30	.03	:53	.21	.52	:17	.0685	.05
6-14	.04	T	3:15	.08	.55	6:15	.218	.11
6-15	0	0	:30	0	.55	:25	.120	.17
6-16	.11	0	:15	.04	.56	4:0	.354	.26
6-17-18	0	0	1:26	.22	.71	:15	.102	.29
6-19	.02	0	:30	1.35	.80	:19	.675	.33
6-20-22	0	0	:15	.2	.86	:55	1.57	.15
6-23	.06	0	5:25	.28	1.05	:59	1.25	.54
6-24	2.19	.05	:15	.18	1.21	7:03	.869	.61
6-25	0	T	6:08	.60	1.44	:23	.267	.79
6-26-27	0	0	:16	.15	1.50	:35	.118	.83
6-28	.192	0	:21	1.56	1.63	:15	.112	.85
			:29	.90	1.75	8:05	.0592	.88
			:15	.56	1.90	:15	.0213	.90
			:50	1.56	2.03	9:19	.0117	.91
			:55	2.28	2.22	12:00m	.0068	.94
			7:00	2.52	2.43			
			:05	1.92	2.59			
			:11	.70	2.66			
			:20	.40	2.72			
			8:00	.24	2.88			
			:15	.04	2.89			
<u>Watershed conditions:</u> In corn, wheat, meadow, meadow rotation (conservation practice with contour strips) since 1941. Corn and meadow strips in 1957. Corn 32", weeds 24" high. Meadow strips, legumes, grass and weeds 10" high.								
Notes: 1/ Rain ended about 7:30a.								

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 187					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of January 21, 1959</u>								
12-21-22-58	0	0	1-21-59	Raingage	116	1-21-59		
12-23	T 1/	0	12:01a	0	0	12:01a	0.0117	0
12-24	T 1/	0	1:42	.06	.04	1:50	.0563	.05
12-25-31	0	0	1:57	.20	.09	2:20	.0928	.09
1-1-59	.58	0	1:47	.10	.17	1:42	.143	.13
1-2-3	0	0	2:17	.30	.32	4:18	.0718	.28
1-4	.04 1/	0	3:08	.05	.36	1:36	.153	.30
1-5-8	0	0	4:07	.09	.45	1:41	.267	.33
1-9-10	T 1/	0	1:22	.36	.54	5:12	.354	.48
1-11-13	0	0	1:37	.88	.76	6:00	.183	.68
1-14	.29 2/	0	5:26	.21	.93	1:20	.112	.73
1-15	.61 2/	0	1:47	.31	1.04	7:16	.0380	.79
1-16-19	.30 1/	0	7:22	.09	1.09	8:18	.0428	.83
1-20	.44	.10	8:27	.03	1.12	1:32	.0333	.83
			9:09	.29	1.32	9:00	.0623	.86
			10:05	.09	1.40	1:20	.101	.88
			11:06	.36	1.77	10:12	.0785	.97
			12:00m	.07	1.83	1:30	.117	1.00
			1:27p	0	1.83	11:10	.205	1.11
			1:38	.22	1.87	1:46	.108	1.21
			3:52	.02	1.90	1:30p	.0357	1.30
			5:02	.14	2.06	1:50	.0455	1.31
			1:17	.88	2.28	3:10	.0333	1.36
			7:02	.09	2.44	5:06	.108	1.44
						1:20	.281	1.49
						1:38	.183	1.56
						6:20	.0966	1.65
						7:30	.0592	1.74
						12:00m	.0270	1.90

Notes: 1/ Snow  
2/ Rain and snow

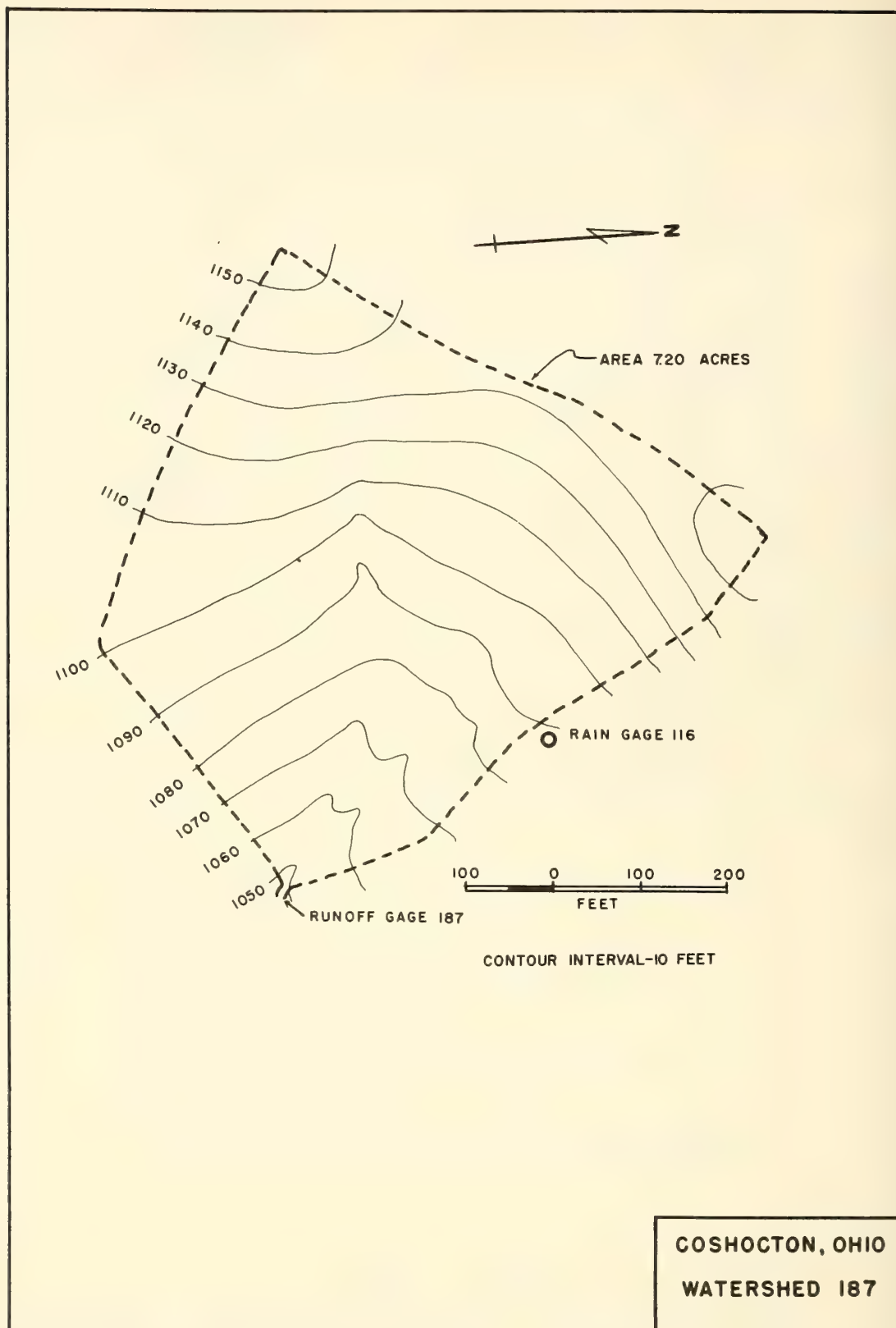


COSHOCTON, OHIO WATERSHED 187



COSPECTON, OHIO WATERSHED 187





MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 192 (Area - 7.59 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956	P Q	1.52 .14	5.48 1.74	3.24 .27	3.85 .06	6.99 .32	4.22 .17	6.95 .54	4.33 T	1.49 0	1.17 0	1.34 0	2.97 .06	43.55 3.30		
1957	P Q	1.54 .39	1.23 T	1.73 T	4.84 .89	4.19 T	9.83 1.62	3.67 .14	2.65 .05	4.24 .07	1.45 0	2.83 .05	4.01 .48	42.21 3.69		
1958	P Q	1.51 .24	.75 .10	.88 0	3.45 .01	3.17 .16	4.65 .03	7.45 .61	3.03 .02	3.23 T	.34 0	1.88 0	.66 0	31.00 1.17		
1959	P Q	5.38 2.51	2.34 .59	2.26 .02	3.89 .08	2.68 0	4.40 .05	4.74 T	2.37 .11	2.66 T	4.95 T	2.46 .05	1.89 .16	40.02 3.57		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 192								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	2.09	6-12	0.69	6-12	0.70	6-28	0.76	6-28	0.78	6-28	0.80	6-28	0.81	6-24	0.90
1958	7-22	.60	7-22	.20	7-22	.21	7-22	.22	7-22	.22	7-22	.22	7-22	.22	1-21	.24
1959	1-21	.60	1-21	.42	1-21	.53	1-21	.85	1-21	1.51	1-20	2.17	1-20	2.30	1-20	2.36
Notes: Quality of records: monthly P, excellent, C, good; annual maximum discharges and volumes, excellent. Cover 1956, 1st year meadow; 1957, 2nd year meadow; 1958, corn; 1959, wheat; prevailing practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 192								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)						
Event of September 23, 1945																
8-23-45	.01	0		9-23-45	Raingage	12 <sup>R</sup>		9-23-45								
8-24	.07	0		5:29p	0	0		5:44p	0	0						
8-25-31	0	0		:32	.00	.20		:54	.0256						T	
9-1	.16	0		:40	.60	.28		6:02	.0507						.01	
9-2-7	0	0		:46	0	.28		:30	.0154						.02	
9-8	.85	0		:48	4.20	.42		:36	.0881						.02	
9-9	.94	0		:52	.60	.46		:44	.212						.04	
9-10	.74	0		6:14	0	.46		7:00	.411						.10	
9-11	.04	0		:16	.30	.47		:11	.789						.27	
9-12	0	0		:24	0	.47		:24	.382						.37	
9-13	.32	0		:30	1.70	.64		:30	.210						.40	
9-14	1.23	T		:39	1.13	.81		:36	.163						.42	
9-15-16	0	0		:52	.88	1.03		:16	.0881						.44	
9-17	.54	0		:58	2.40	1.19		8:06	.0361						.45	
9-18	1.06	.03		7:00	4.20	1.33		:14	.0295						.46	
9-19	0	0		:05	3.00	1.58		:24	.0811						.47	
9-20	.11	.01		:09	1.20	1.66		:30	.391						.49	
9-21-22	0	0		:12	3.00	1.83		:42	.431						.58	
9-23	.33 1/2	0		:32	.45	1.98		:48	.280						.62	
				:50	.07	2.00		9:00	.136						.66	
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing practice) since 1942. Meadow in 1945. Grass and legumes 6" high, weeds 12" high.				8:07	0	2.00		:10	.0845						.67	
				:10	.20	2.01		:30	.0456						.69	
				:15	0	2.01		10:00	.0316						.71	
				:20	1.08	2.10		:50	.0220						.74	
				:26	.70	2.17		12:00 m	.0125						.75	
				:28	5.70	2.34										
				:40	1.55	2.65										
				:54	.17	2.69										
				9:22	.04	2.71										
				10:00	.09	2.77										
				12:00 m	.02	2.81										
Notes: To convert runoff in in/hr to cfs, multiply by 7.6535. 1/ Most of rainfall occurred after 3:29p.																

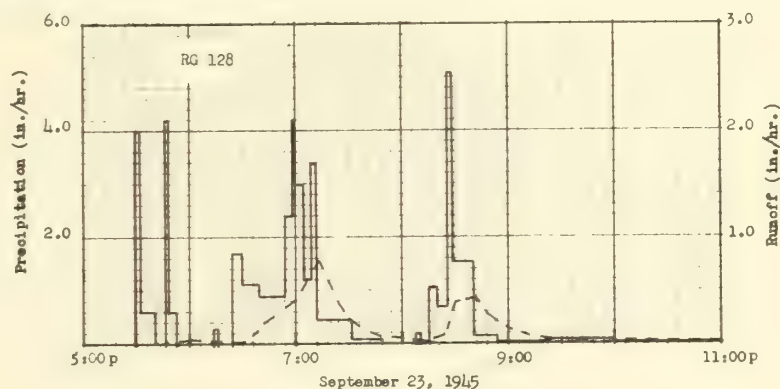
Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station.

SELECTED RUNOFF EVENTS						Cosnocton, Ohio Watershed 192		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	0	0	6-12-57	Raingage	128	6-12-57		
5-14	1.60	T	3:11p	0	0	3:45p	0	0
5-15	.04	0	:16	3.30	.11	:51	.195	.01
5-16-17	0	0	:26	.78	.24	:53	1.06	.03
			:43	3.21	1.15	:55	1.74	.08
5-18	.18	0	:48	6.36	1.68	:57	1.89	.14
5-19	.26	0	:53	6.24	2.20	:59	2.01	.20
5-20	.14	0	:59	5.00	2.70	4:01	2.09	.27
5-21	0	0	4:16	.11	2.73	:03	1.93	.34
5-22	.52	0	:28	.15	2.76	:05	1.74	.40
5-23-25	0	0	:52	.22	2.85	:07	1.37	.45
5-26	.18	0				:15	.685	.58
5-27-31	0	0				:23	.320	.65
6-1	.10	0				:29	.127	.67
6-2-7	0	0				:39	.0456	.68
6-8	.84	0				6:43	0	.70
6-9-10	0	0						
6-11	.35	0						
6-12	0	0						
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing practice) since 1942. Second year meadow in 1957. Grass and legumes 12" high, weeds 12" high.								
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage	128	6-28-57		
6-1	.10	0	1:03p	0	0	3:10p	0	0
6-2-7	0	0	:06	4.40	.22	4:36	.0125	.01
6-8	.84	0	:38	.02	.23	:58	.0507	.02
6-9-10	0	0	:42	2.25	.38	5:12	.0338	.03
6-11	.35	0	2:00	.03	.39	:48	.127	.07
6-12	2.85	.70	:06	.40	.43	6:26	.229	.17
6-13	.37	.02	:18	.10	.50	:44	.229	.24
6-14	.02	0	:54	.90	.59	:58	.776	.34
6-15	0	0	4:22	.07	.70	7:28	.293	.62
6-16	.02	0	:28	1.10	.81	:48	.136	.68
6-17-18	0	0	:44	.34	.90	9:10	.0170	.75
6-19	.02	0	5:12	.17	.98	12:00m	.0035	.78
6-20-22	0	0	6:12	.53	1.51			
6-23	.11	0	:40	.81	1.89			
6-24	2.26	.09	:54	2.10	2.38			
6-25-27	0	0	7:11	.53	2.53			
6-28	.18 1/	0	:44	.20	2.64			
			8:00	.08	2.66			
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing practice) since 1942. Second year meadow in 1957. Grass, legumes, and weeds 14" high.								
Notes: 1/ Rain ended about 7:30a.								

SELECTED RUNOFF EVENTS					Coshocton, Ohio      Watershed 192			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Raingage	128	1-21-59		
12-23	T	0	12:01a	0	0	12:01a	0.0256	0
12-24	T 1/	0	2:00	.10	.19	2:00	.0715	.07
12-25-31	0	0	2:26	.31	.35	2:26	.140	.12
1-1-59	.68	.07	3:08	.08	.48	3:24	.119	.25
1-2	0	.01	3:18	0	.48	3:16	.0811	.33
1-3	0	0	3:30	.50	.58	3:31	.163	.36
1-4	.02 1/	0	3:40	1.07	.83	3:42	.465	.40
1-5-8	0	0	5:05	.38	.99	5:00	.600	.47
1-9-10	1/	0	6:04	.19	1.16	5:04	.465	.60
1-11-13	0	0	8:28	.	1.23	5:10	.502	.64
1-14	.32	0	8:18	.2	1.44	5:18	.399	.70
1-15	.50 2/	.03	10:12	.10	1.53	5:30	.240	.77
1-16-19	.30 1/	0	11:08	.36	1.87	6:00	.0953	.84
1-20	.25	.11	12:00n	.08	1.94	5:36	.0534	.88
			1:32p	0	1.94	7:20	.0406	.92
			5:05	.06	2.17	5:52	.0507	.95
			5:13	1.28	2.31	8:30	.0361	.97
			7:20	.10	2.55	9:00	.0881	1.00
Watershed conditions: In corn, wheat, meadow, meadow rotation (prevailing practice) since 1942. Wheat in 1959. Vegetation dormant. Frost penetration 1". Snow cover 5" on January 20.						5:18	.154	1.04
						5:34	.149	1.08
						5:42	.154	1.10
						10:12	.0989	1.16
						5:0	.253	1.24
						11:04	.307	1.35
						5:20	.206	1.41
						5:50	.0916	1.49
						1:30p	.0220	1.55
						5:48	.0507	1.56
						3:30	.0238	1.61
						5:00	.0811	1.68
						5:06	.145	1.69
						5:16	.344	1.74
						5:47	.235	1.88
						6:30	.0861	2.00
						5:58	.0507	2.03
						8:00	.0256	2.07
						10:00	.0140	2.11
						12:00m	.0112	2.13

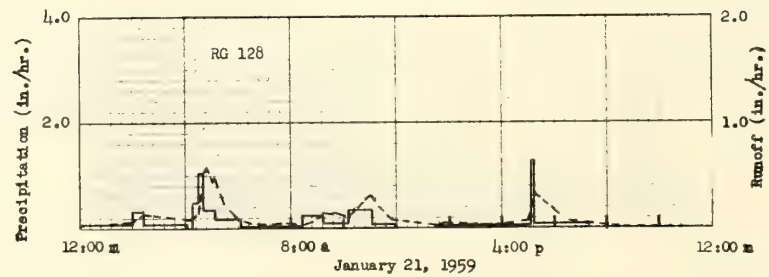
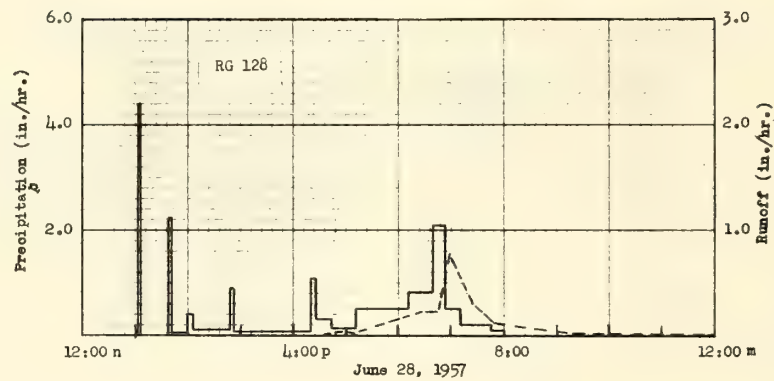
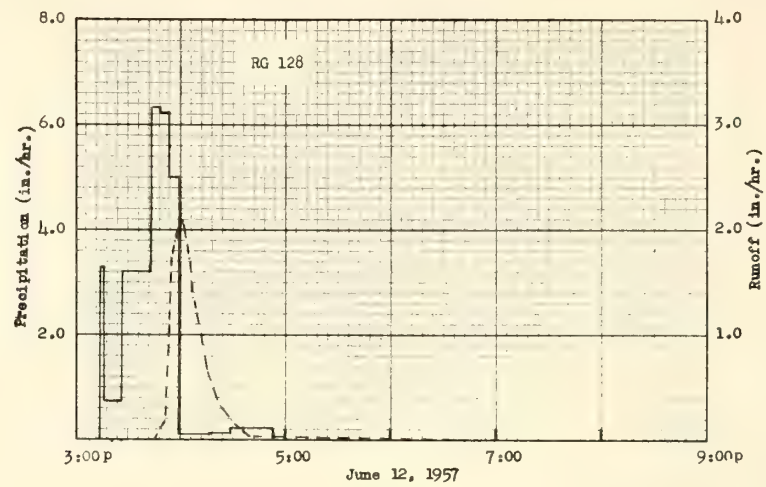
Notes: 1/ Snow  
2/ Rain and Snow

See map of watershed on page 26.23-5.



COSHOCOTON, OHIO      WATERSHED 192





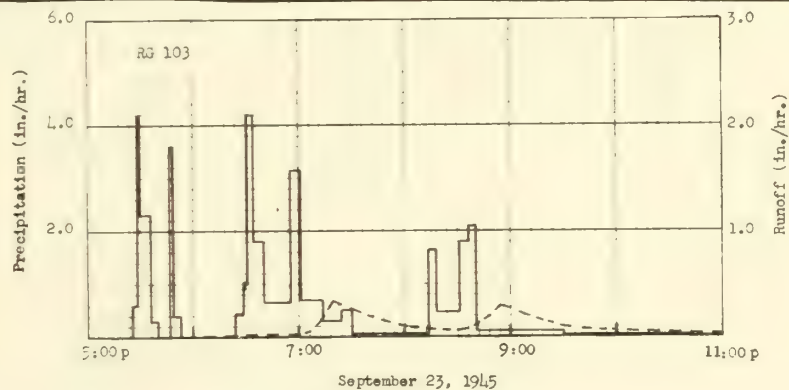
COSHOCOTON, OHIO WATERSHED 192

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 172 (Area - 43.6 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P	1.17	5.22	3.80	3.85	6.87	1.61	6.11	3.86	1.31	1.09	1.15	3.36	13.36			
Q	.31	2.85	2.31	1.95	3.02	1.38	.79	.11	.02	.03	.02	.11	12.93			
1957 P	1.58	1.31	1.79	1.91	1.07	10.80	3.53	1.99	3.90	1.58	2.71	1.07	12.27			
Q	1.16	.31	1.02	5.29	1.16	1.12	.16	.02	.03	.03	.10	1.13	11.86			
1958 P	1.19	.71	.91	3.53	3.01	1.10	9.16	2.86	3.18	.29	2.09	.80	32.19			
Q	.65	.11	.61	1.18	1.91	.06	1.20	.30	.03	.02	.09	.07	6.93			
1959 P	5.87	2.78	2.11	1.21	2.72	1.35	1.15	2.28	2.89	1.87	2.62	1.91	11.15			
Q	2.11	2.22	1.01	2.01	1.01	.38	.08	.19	.01	.05	.22	.72	10.97			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 172								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	2.61	6-12	1.07	6-12	1.23	6-12	1.38	6-12	1.16	6-12	1.58	6-12	1.76	1-3	3.22
1958	7-22	.15	5-1	.10	5-1	.16	5-1	.32	5-1	.17	5-1	.61	5-1	.83	1-28	1.67
1959	1-21	.28	1-21	.19	1-21	.30	1-21	.62	1-21	1.16	1-21	1.69	1-21	1.88	1-21	2.10
Notes: Quality of records: monthly P and Q, good; annual maximum discharges and volumes, good. Watershed conditions 1956-1959, 33% uneven age hardwoods, 67% pines planted in 1938.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 172								
Antecedent conditions			Rainfall					Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1915																
8-23-45	T	0	9-23-15	Raingage	103	9-23-15										
8-24	.05	0	5:26p	0	0	5:56p	0.0027	0								
8-25-31	0	0	:28	.60	.02	7:00	.0213	.008								
9-1	.16	0	:30	1.20	.16	:06	.0573	.012								
9-2-7	0	0	:36	2.30	.39	:12	.150	.022								
9-8	.55	T	:10	.30	.11	:20	.353	.058								
9-9	.73	T	:17	0	.11	:12	.189	.160								
9-10	.68	T	:19	3.60	.53	8:01	.0892	.209								
9-11	.21	T	:52	.10	.55	:30	.0632	.236								
9-12	0	T	6:12	0	.55	:36	.0792	.245								
9-13	.29	T	:28	.15	.58	:12	.131	.256								
9-14	1.09	.01	:32	1.05	.65	:16	.207	.273								
9-15	0	T	:31	1.20	.79	:51	.298	.259								
9-16	0	T	:11	1.80	1.00	9:00	.271	.327								
9-17	.56	T	:55	.61	1.15	:18	.150	.390								
9-18	1.01	.02	7:02	3.17	1.52	:21	.126	.404								
9-19	0	.01	:11	.70	1.66	:30	.103	.415								
9-20	.38	T	:21	.30	1.71	:10	.0823	.431								
9-21-22	0	T	:31	.50	1.76	10:00	.0573	.451								
9-23	.151	T	8:11	.01	1.79	11:00	.0291	.483								
Watershed conditions: One-third of area in hardwoods, 2/3 area reforested to pines. Hardwoods were up to 60 feet high, shrubs 2 to 10 feet high. Leaf litter over all of hardwoods area 1/2" to 1" deep. Pines were 10 feet high, weeds 2 1/2 feet, and grass 5" high on reforested area.			:18	1.65	1.90	12:00m	.0165	.516								
			:32	.17	2.01											
			:36	1.80	2.13											
			:10	2.10	2.27											
			9:30	.12	2.37											
			10:12	.01	2.12											
Notes: To convert runoff in in/hr to cfs, multiply by 43.963. 1/ Most of rain occurred after 3:26p.																

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 172		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 12, 1957</u>								
5-13-57	0	.03	6-12-57 3:07p	Rainage 0	103 0	6-12-57 3:00p	0.00011	0
5-14	1.12	.22	:12	1.20	.10	:30	.0086 <sub>h</sub>	T
5-15	.04	.10	:19	1.11	.23	:34	.0209	.001
5-16	0	.05	:22	.20	.24	:40	.0544	.005
5-17	0	.04	:24	2.10	.31	:44	.122	.011
5-18	e .18	.03	:30	4.90	.80	:46	.255	.017
5-19	e .20	.05	:40	5.58	1.73	:48	e .60	.030
5-20	e .19	.06	:48	3.15	2.15	:52	e 1.49	.100
5-21	0	.04	:51	7.80	2.54	:56	e 2.26	.225
5-22	.51	.11	4:12	1.77	3.16	4:00	e 2.64	.398
5-23	0	.06	:14	1.20	3.20	:08	e 1.89	.690
5-24	0	.04	:19	.24	3.22	:16	e .960	.885
5-25	0	.03	:22	0	3.22	:20	e .764	.943
5-26	.14	.02	:40	.33	3.32	:24	e .578	.987
5-27	0	.02	5:28	.05	3.36	:40	e .250	1.091
5-28-31	0	.04				:50	e .200	1.139
6-1	.18	T				5:30	e .100	1.227
6-2-7	0	T				6:00	e .060	1.267
6-8	.98	T				:40	.0368	1.299
6-9-10	0	T				8:00	.0298	1.344
6-11	.30	T				9:00	.0240	1.372
6-12	0	T						
Watershed conditions: One-third of area in hardwoods, 2/3 area reforested to pines. Hardwoods up to 70 ft. high, shrubs 18", herbs 1", litter 1" deep. Pines on reforested area were 20 ft. high, weeds 6" high. Litter 1/2" deep.								
<u>Event of June 28, 1957</u>								
5-28-31-57	0	0.03	6-28-57 12:56p	Rainage 0	103 0	6-28-57 12:00n	0.0009	0
6-1	.18	T	1:00	3.45	.23	3:12p	.0250	.0189
6-2-7	0	T	:32	.08	.27	5:20	.0544	.0766
6-8	.98	T	:36	1.35	.36	6:10	.207	.1827
6-9-10	0	T	:53	.04	.37	:30	.337	.2728
6-11	.30	T	2:01	.75	.47	:48	.619	.3985
6-12	3.36	1.43	:28	.02	.48	:56	.969	.5113
6-13	.15	.24	:46	.23	.55	7:02	.864	.6039
6-14	.04	.12	:50	1.95	.68	:12	.689	.7344
6-15	0	.06	4:18	.07	.78	:24	.484	.8486
6-16	.12	.03	:24	1.20	.90	:50	.255	1.0006
6-17-18	0	.03	5:08	.23	1.07	8:12	.163	1.0770
6-19	.02	.01	6:04	.55	1.58	9:08	.0664	1.1728
6-20	0	.01	:09	1.44	1.70	10:30	.0384	1.2100
6-21-22	0	T	:32	.65	1.95	12:00 m	.0291	1.2919
6-23	.10	T	:40	1.95	2.21			
6-24	2.22	.32	:45	1.56	2.34			
6-25	.03	.08	:49	1.80	2.46			
6-26-27	0	.05	7:00	.65	2.58			
6-28	.20 1/	T	:16	.30	2.66			
Watershed conditions: One-third of area in hardwoods, 2/3 of area reforested to pines. Hardwoods up to 70 ft. high, shrubs 18", herbs 6", litter 1" deep. Pines on reforested area were 20 ft. high, weeds 7" high. Litter 1/2" deep.								
Notes: 1/ Rain ended about 7:30a.								

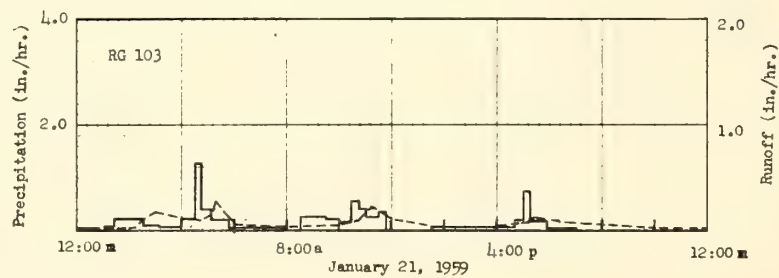
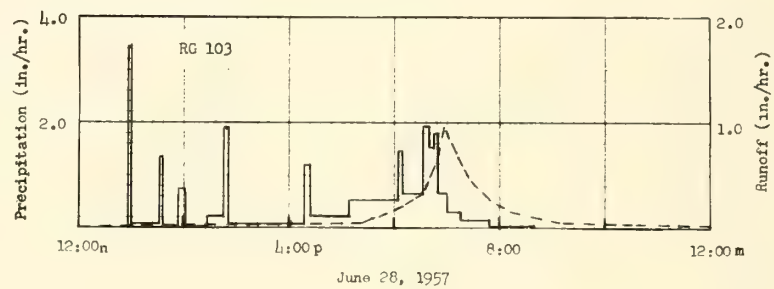
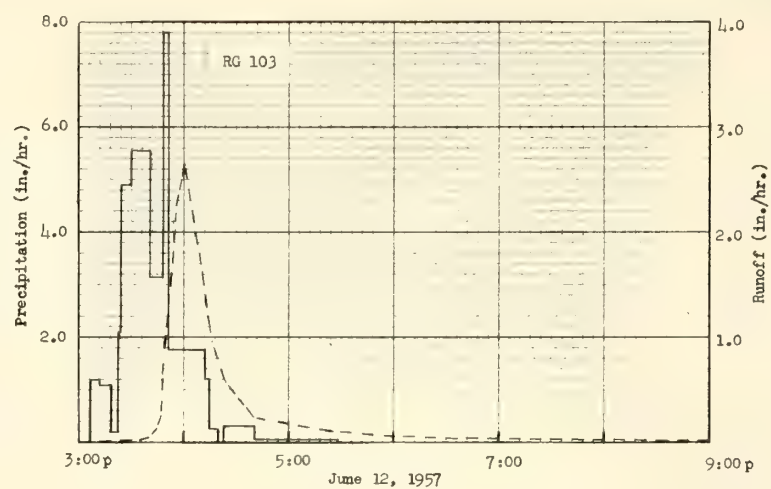
SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 172					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	T	1-21-59	Raingage	103	1-21-59		
12-23	T	T	12:01a	0	0	12:01a	0	0
12-24	T 1/	T	5:52	.06	.05	2:11	.0131	.065
12-25-31	0	T	1:04	0	.05	3:36	.107	.092
1-1-59	.62	.03	2:21	.09	.08	3:00	.180	.150
1-2-3	0	e .06	2:32	.23	.31	4:00	.122	.301
1-4	.02 1/	e .01	3:08	.10	.40	4:0	.0996	.377
1-5-8	0	e .04	5:8	.07	.46	5:01	.151	.421
1-9-10	T 1/	e .01	4:28	.22	.57	5:18	.278	.695
1-11-13	0	e .02	4:44	1.28	.91	5:42	.151	.566
1-14	.25	e .01	5:08	.10	1.07	6:02	.0728	.605
1-15	.73 2/	e 7	5:8	.20	1.20	7:50	.0287	.676
1-16-19	.30 1/	e .01	7:52	.05	1.30	10:00	.0511	.755
1-20	.51	e .02	8:30	0	1.30	11:2	.0996	.799
			9:28	.26	1.55	11:00	.167	.811
			10:00	.21	1.66	1:16	.222	.895
			1:26	.16	1.73	12:00n	.111	1.016
			1:41	.57	1.90	1:30p	.0511	1.132
			11:00	.11	2.01	3:50	.0359	1.210
			1:28	.21	2.12	5:12	.0858	1.302
			1:8	.36	2.21	5:21	.131	1.325
			1:32p	0	2.21	6:21	.0858	1.411
			4:10	.06	2.43	e 12:00m	.0300	1.6716
			5:01	.20	2.50			
			5:11	.71	2.66			
			5:51	.18	2.78			
			7:00	.03	2.81			

Notes: 1/ Snow  
2/ Rain and snow



COSHOCOTON, OHIO WATERSHED 172

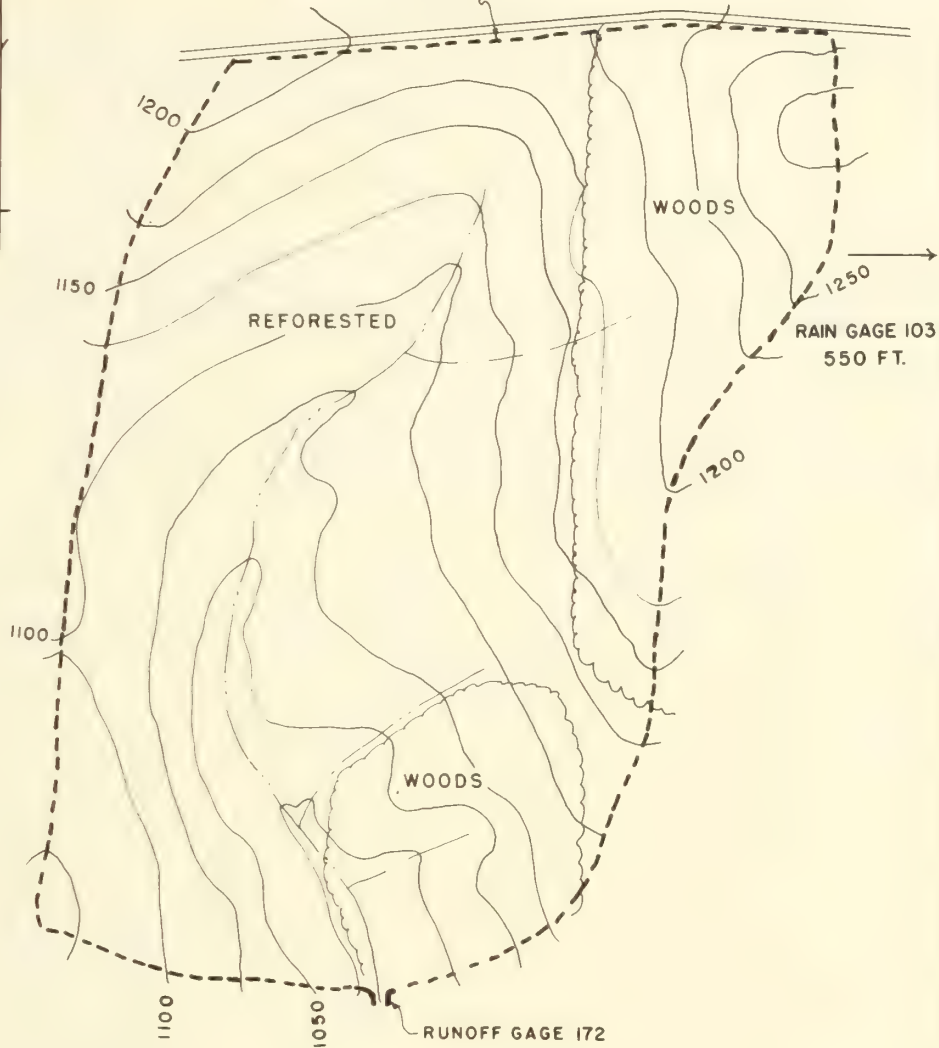




COSHOCTON, OHIO WATERSHED 172



AREA 43.6 ACRES



CONTOUR INTERVAL-25 FEET

COSHOCTON, OHIO  
WATERSHED 172

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 169 (Area - 29.0 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956	P 1.41 Q .11	5.36 2.00	3.05 1.41	3.68 .79	6.87 1.26	1.56 .80	7.06 1.55	1.08 .24	1.47 .03	1.10 0	1.41 T	2.77 .13	42.82 8.32			
1957	P 1.44 Q .63	1.18 .42	1.48 .50	1.36 2.57	3.99 .21	10.41 2.78	3.85 .39	2.48 .09	1.29 .16	1.54 0	2.75 .07	3.97 1.32	41.74 9.14			
1958	P 1.27 Q .42	.70 .22	.74 .15	3.44 .35	3.19 .84	1.65 .08	7.92 .64	3.11 .16	3.02 .05	.36 0	1.79 T	.44 0	30.63 2.91			
1959	P 5.71 Q 2.81	3.11 1.26	2.26 .52	3.87 .37	2.72 .08	1.80 .36	4.80 .09	2.46 .17	2.73 T	4.95 .11	2.73 .15	2.07 .70	42.21 6.62			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 169								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	2.59	6-12	0.85	6-28	1.02	6-28	1.23	6-28	1.29	6-28	1.33	6-28	1.38	4-3	1.88
1958	7-31	.24	7-22	.13	5-4	.14	5-4	.23	5-4	.30	5-4	.35	5-4	.40	5-3	.69
1959	6-12	.53	1-21	.36	1-21	.52	1-21	.86	1-21	1.39	1-21	2.12	1-21	2.37	1-20	2.68
Notes: Quality of records: P and Q, good; annual maximum discharges and volumes, good. Mixed cover 1956 to 1959; 6% hardwoods, 6% reforested, 48% grassland, 34% cultivated, 6% miscellaneous; contour strip cropped.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 169								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Raingage	113	9-23-45										
8-24	.06	0	5:28p	0	0	6:00p	0.00667	0								
8-25-31	0	0	:30	3.00	.10	:16	.0438	.0041								
9-1	.17	0	:34	1.50	.20	:30	.0238	.012								
9-2-7	0	0	:46	.25	.25	:49	.129	.025								
9-8	.76	T	:48	1.20	.39	7:12	.971	.169								
9-9	.96	.01	:50	.60	.41	:18	1.37	.291								
9-10	.72	.01	6:14	0	.41	:30	.910	.529								
9-11	.04	T	:24	.06	.42	:36	.619	.605								
9-12	0	0	:28	2.10	.58	:54	.139	.703								
9-13	.29	0	:36	.90	.70	8:00	.0999	.715								
9-14	1.20	.06	:38	2.10	.78	:06	.0694	.724								
9-15-16	0	0	:50	.90	.96	:18	.0407	.735								
9-17	.50	.01	:54	1.05	1.03	:30	.0817	.744								
9-18	1.01	.07	:56	1.80	1.09	:36	.369	.764								
9-19	0	0	7:00	3.75	1.34	:47	.828	.887								
9-20	.49	.03	:04	2.70	1.52	9:00	.496	1.036								
9-21-22	0	0	:10	1.90	1.71	:06	.312	1.076								
9-23	.281/	T	:12	3.60	1.83	:18	.129	1.116								
			:30	.33	1.93	:44	.0653	1.142								
Continued on next page																
Notes: To convert runoff in in/hr to cfs, multiply by 29.241. 1/ Most of rainfall occurred after 3:28p.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station.

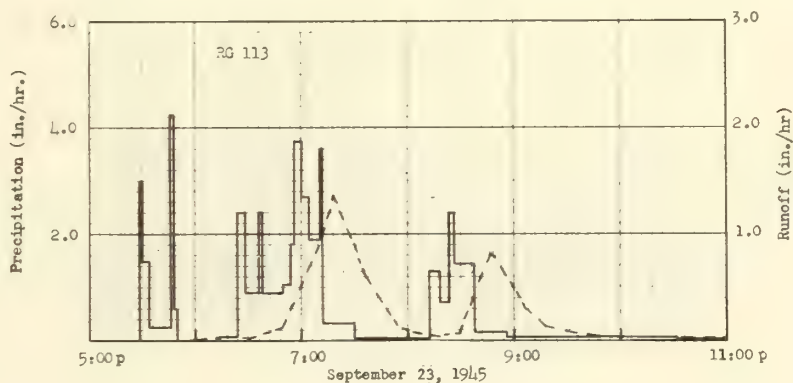
SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 169					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 23, 1945 - Continued								
Watershed conditions: Mixed cover under conservation practice. 31.0% of the area was in corn-meadow strips; corn was 120" high, weeds 48" high. In meadow strips, legumes were 12" high, grass 8" high, weeds 12" high. 28.8% of the area was in wheat-meadow strips and 6.8% in wheat going to meadow after cutting in July. Legumes and weeds were 12" high, grass 5" high. 8.3% of the area was in pasture. Legumes and grasses 8" high. 3.0% of the area was in hardwood forest and 10.0% was reforested to pines. Pines were 9 feet high and shrubs 1-8", weeds 1-4" high. 3.4% of the area was in orchard and 5.9% in miscellaneous cover (farmsteads, roads, etc.)			8:12 p	0.03	1.95	9:18 p	0.0189	1.155
			:18	1.30	2.08	10:08	.0331	1.166
			:23	.72	2.11	:36	.0222	1.181
			:26	2.40	2.26	11:21	.0119	1.191
			:38	1.45	2.55	12:00m	.00719	1.200
			:56	.17	2.60			
			10:32	.06	2.69			
			12:00m	.01	2.70			
Event of June 12, 1957								
5-13-57	0	T	6-12-57	Raingage	11?	6-12-57		0
5-14	1.1	.05	8:12 p	0		3:12 p	.011	.011
5-15	.01	.01	:18	1.37	.08	:10	.109	.013
5-16	0	T	:24	1.01	.11	:12	.312	.010
5-17	0	0	:30	1.95	.71	:14	.828	.017
5-18	.15	T	:36	6.80	1.12	:56	2.59	.291
5-19	.24	.01	:42	7.4	1.80	1:04	2.35	.457
5-20	.19	.01	:48	8.30	2.63	1:06	1.38	.612
5-21	0	T	:54	1.61	3.08	:12	.691	.711
5-22	.51	.01	:00	.07	3.09	:14	.356	.792
5-23	0	T	:06	.11	3.11	:30	.129	.836
5-24-25	0	0	:12	.10	3.21	:38	.058	.861
5-26	.12	T	:18	.01	3.22	5:00	.050	.872
5-27-31	0		:24	.02	3.30	:32	.022	.91
6-1	.12	0				9:00	.702	.914
6-2-7	0	0						
6-8	.81	T						
6-9-10		T						
6-11	.45	T						
6-12	0	0						
Watershed conditions: Mixed cover under conservation practice. 31.0% of the area was in corn-meadow strips. Corn was 26" high, weeds 18" high. In meadow strips, legumes, grass and weeds were 5" high. 28.8% of the area was in wheat-meadow strips and 6.8% in wheat (without strips). Wheat was 30" high, legumes and grass 5" in wheat strips. In meadow strips legumes, grass and weeds were 8" high. 8.3% of the area was in pasture. Legumes and grasses 5" high, weeds 0" high. 3% of the area was in hardwood forest and 10.0% was reforested to pines in 1939. 3.4% of the area was in orchard and 5.9% in miscellaneous cover (farmsteads, roads, etc.).								
Notes:								



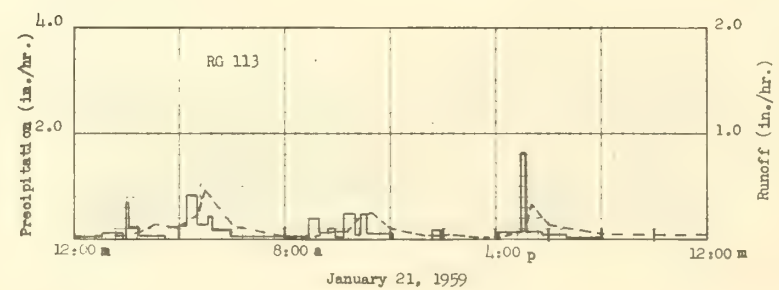
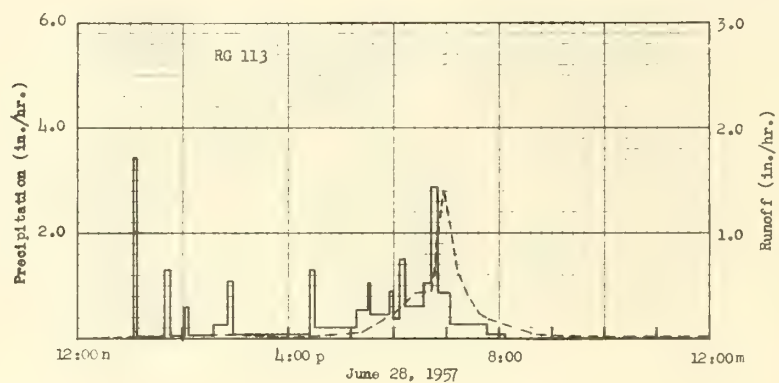
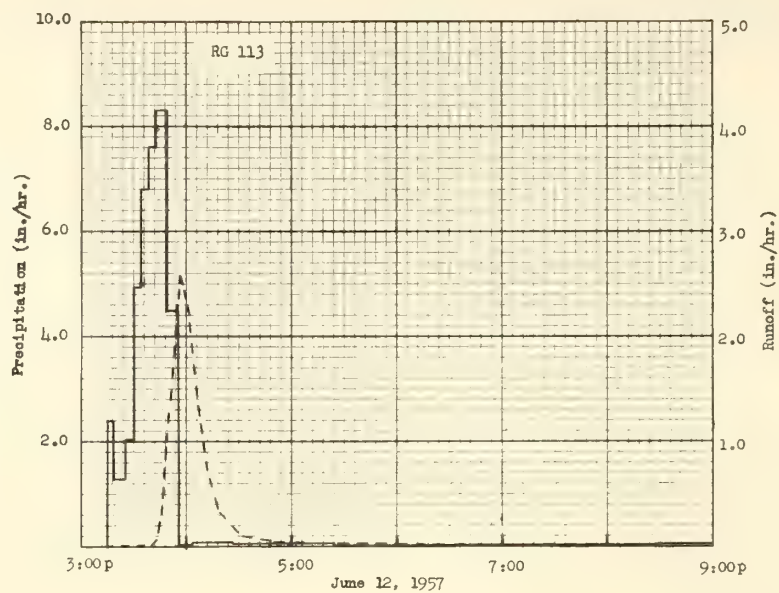
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 169		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 28, 1957								
5-28-31-57	0	0	6-28-57	Raingage	113	6-28-57		
6-1	.12	0	1:03p	0	0	12:00m	0.0001	0
6-2-7	0	0	:07	3.45	.23	2:00p	.0176	.0097
6-8	.81	.01	:39	.02	.21	3:08	.0321	.0211
6-9-10	0	T	:44	1.32	.35	4:00	.00667	.0381
6-11	.35	T	2:01	.01	.36	:41	.0118	.0166
6-12	3.30	.92	:06	.60	.41	5:21	.0653	.0891
6-13	.38	.07	:35	.06	.41	6:00	.238	.1885
6-14	.01	.01	:51	.26	.51	:21	.138	.3217
6-15-22	0	.01	:56	1.08	.60	:40	.155	.4379
6-23	.10	T	4:24	.07	.70	:47	.728	.5015
6-24	2.32	.28	:29	1.32	.81	:49	.930	.5291
6-25-27	0	.03	5:17	.21	.98	:56	1.10	.6731
6-28	.12 1/	.012/	:29	.55	1.09	7:00	1.25	.7611
			:33	1.05	1.16	:12	.671	.9193
			:53	.45	1.31	:24	.107	1.0510
			:59	.90	1.40	:36	.215	1.1179
			6:07	.38	1.45	:48	.183	1.1607
			:13	1.50	1.60	8:21	e .0653	1.2269
			:33	.60	1.80	:36	e .0107	1.2375
			:41	1.05	1.91	9:20	.0191	1.2582
			:50	2.87	2.37	10:00	.0125	1.2688
			7:04	.86	2.57	12:00m	.00588	1.2863
			:45	.27	2.75			
			8:05	.06	2.77			
Watershed conditions: Mixed cover under conservation practice. 31.0% of the area was in corn-meadow strips. Corn was 32" high, weeds 10" high. In meadow strips, legumes, grass, and weeds were 8" high. 21.6% of the area was in wheat-meadow strips and 6.8% in wheat (without strips). Wheat was 36" high and legumes and grass were 11" high in wheat areas. In meadow strips, legumes, grass, and weeds were 8" high. 8.3% of the area was in pasture. Legumes and grass were 5" high, weeds 6" high. 3% of the area was in hardwoods forest and 10.0% was reforested to pines in 1939. 3.4% of the area was in orchard and 5.9% in miscellaneous cover (farmsteads, roads, etc.)								
Notes: 1/ Rain ended about 7:30a. 2/ Runoff prior to 12:00n.								

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 169					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0	1-21-59	Rainage	113	1-21-59		
12-23	T	0	12:01a	0	0	12:01a	e 0.0407	0
12-24	T 1/2	0	1:06	.06	.07	2:00	.0407	e .080
12-25-31	0	0	:56	.16	.20	:40	.0906	.113
1-1-59	.60	T	2:00	0	.20	3:04	.155	.162
1-2-3	0	0	:06	.70	.27	:40	.124	.244
1-4	.02 1/2	0	:30	.25	.37	1:00	.124	.286
1-5-8	0	0	3:30	.09	.46	:46	.215	.106
1-9-10	T 1/2	0	:58	0	.46	5:00	.165	.494
1-11-13	0	0	4:19	.26	.55	:34	.298	.714
1-14	.29	0	:42	.83	.87	6:00	.150	.804
1-15	.71 2/3	0	5:06	.28	.98	8:20	.0243	.954
1-16-19	.30 1/2	0	:14	.15	1.04	:56	.0243	.969
1-20	.43	0	:58	.19	1.18	9:20	.0571	.985
			8:55	.06	1.37	:56	.0906	1.030
Watershed conditions: Mixed cover under conservation practice. 3.0% of the area had been in wheat-meadow strips in 1958. 28.6% of the area was in wheat-meadow strips in 1959. 6.8% of the area was in 2nd year meadow of a corn-wheat-meadow-rotation. 8.3% of the area was in pasture. All vegetation was in dormant state, frost penetration 1". 3% of the area was in hardwood forest and 10.4% was reforested to pines in 1939. 3.4% was in orchard and 5.9% in miscellaneous cover (farmsteads, roads, etc.). Snow cover 5" on January 20.			9:15	.39	1.50	10:24	.0817	1.070
			:37	.14	1.55	:54	.219	1.140
			:54	.21	1.61	11:15	.258	1.220
			10:14	.03	1.62	12:00m	.109	1.347
			:43	.50	1.86	1:20p	.0407	1.446
			:50	.09	1.87	:50	.0407	1.457
			11:06	.19	2.00	2:16	.0489	1.477
			12:06p	.10	2.10	3:10	.0243	1.510
			1:36	0	2.10	4:10	.0243	1.534
			:54	.20	2.16	5:10	.0999	1.583
			4:02	0	2.16	:22	.340	1.625
			:59	.16	2.31	6:00	.150	1.771
			5:10	1.64	2.61	8:10	.0407	1.946
			:46	.17	2.71	12:00m	e .0407	2.116
			4:38	.10	2.80			
			8:06	.01	2.82			

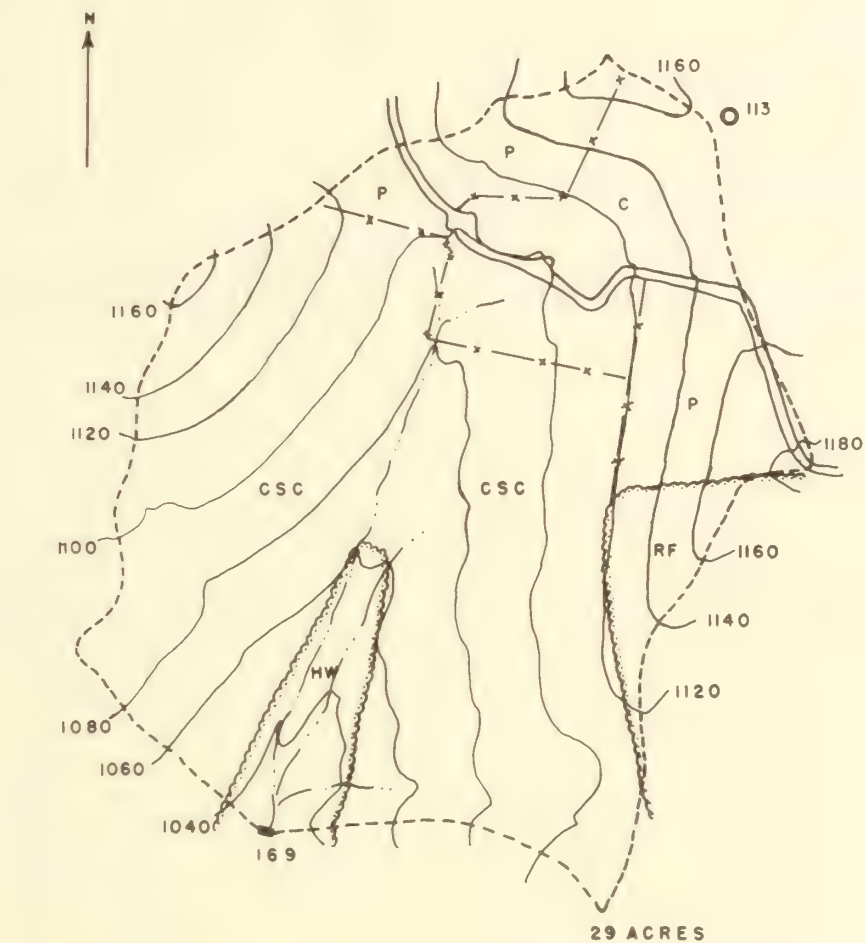
Notes: 1/ Snow  
2/ Rain and snow



COSHOCOTON, OHIO WATERSHED 169



COSHOCOTON, OHIO WATERSHED 169



#### LEGEND

- P PASTURE
- C CROPPED
- CSC CONTOUR STRIP CROPPED
- RF REFORESTED (PINE)
- HW HARDWOODS
- RAINGAGE
- RUNOFF GAGE



CONTOUR INTERVAL - 20 FEET

**COSHOCTON, OHIO**  
**WATERSHED 169**



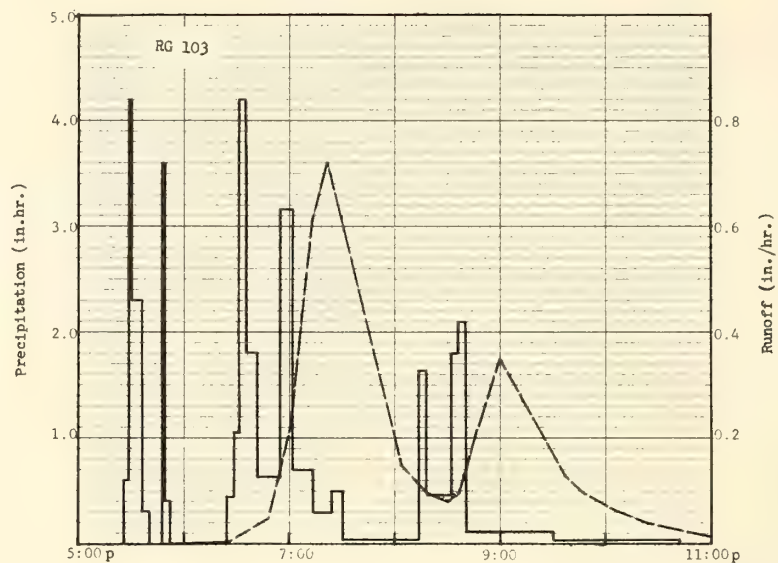
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio (Area - 75.6 acres)		Watershed 177						
Month Year		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.47	5.22	3.80	3.85	6.87	4.61	6.44	3.86	1.34	1.09	1.45	3.36	43.36		
	Q	.23	2.74	1.85	.98	1.51	1.13	1.16	.22	.02	T	T	.21	10.05		
1957	P	1.58	1.31	1.79	4.91	4.07	10.80	3.53	1.99	3.90	1.58	2.74	4.07	42.27		
	Q	.90	.37	.42	2.62	.23	3.67	.28	.04	.06	0	.12	1.76	10.47		
1958	P	1.49	.74	.94	3.53	3.01	4.10	9.16	2.86	3.18	.29	2.09	.80	32.19		
	Q	.37	.21	.35	.48	1.18	.06	1.45	.53	.06	T	0	0	4.69		
1959	P	5.87	2.78	2.44	4.24	2.72	4.35	4.45	2.28	2.89	4.87	2.62	1.94	41.45		
	Q	2.54	1.77	.97	.66	.23	.19	.08	.23	T	.21	.57	1.41	8.86		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio		Watershed 177						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	3.14	6-12	1.33	6-12	1.45	6-12	1.50	6-12	1.52	6-12	1.60	6-12	1.67	4-3	2.43
1958	7-22	.42	7-22	.23	7-22	.27	7-22	.32	7-22	.33	5-4	.38	5-4	.51	5-4	.93
1959	1-21	.44	1-21	e .34	1-21	e .51	1-21	e .86	1-21	e 1.35	1-21	e 1.94	1-20	e 1.98	1-20	e 2.19
Notes: quality of records: monthly P. good; Q. excellent; annual maximum discharges and volumes, excellent. Mixed cover 1956 to 1959; 4% hardwoods, 6% reforested, 67% grassland, 17% cultivated, 6% miscellaneous; contour strip cropped.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio		Watershed 177						
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)						
Event of September 23, 1945																
8-23-45	T			9-23-45	Raingage	1.3		9-23-45								
9-24	.5			5:26p		0		5:28p	0.0030	0						
8-25-31	0			:28	.60	.02		6:26	.00523	.003						
9-1	.16			:30	4.20	.16		:43	.0512	.010						
9-2-7		0		:36	2.30	.39		7:01	.226	.135						
9-8	.55			:40	.30	.41		:13	.609	.117						
9-9	.73	T		:47		.41		:21	.721	.206						
9-10	.69			:49	3.60	.53		3:13	.147	.438						
9-11	.21	0		:52	.40	.55		:17	.0963	.516						
9-12		0		6:24		.55		:29	.0778	.533						
9-13	.29			:23	.45	.58		:37	.0963	.545						
9-14	1.09	T		:32	1.05	.63		:47	.226	.569						
9-15-16				:34	4.20	.79		:53	.343	.629						
9-17	.56			:41	1.80	1.00		9:13	.270	.703						
9-18	1.04	.04		:55	.64	1.15		:37	.129	.776						
9-19		T		7: 2	3.17	1.52		:47	.0963	.797						
9-20	.38	.01		:14	.70	1.66		1: 05	.606	.897						
9-21-22		T		:24	.30	1.71		:24	.0391	.836						
9-23	.151	T		:30	.50	1.76		12: 0m	.120	.071						
				3:14	.4	1.79										
				:15	1.65	1.9										
				:32	.47	2.01										
				:36	1.8	2.13										
				:41	2.10	2.27										
				9:30	.12	2.37										
				10:42	.04	2.42										
(See next page for other raingage totals and watershed conditions.)																
Notes: To convert runoff in in/hr to cfs, multiply by 76.231. 1/ Most of rainfall occurred after 3:26p.																



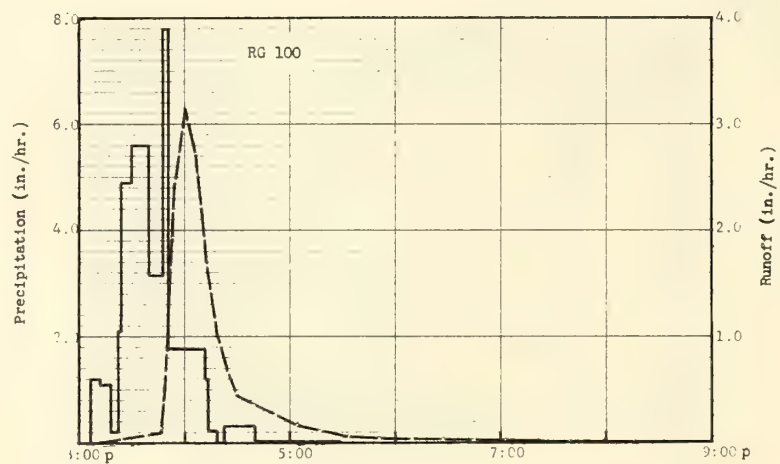
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 177		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 28, 1957								
5-28-57	0	T	6-28-57	Raingage	103	6-28-57		
5-29-31	0	0	12:56p	0	0	1:00p	.000765	C
6-1	.18	0	1:00	3.45	.23	3:00	.0177	.018
6-2-7	0	0	:32	.08	.27	:40	.0345	.033
6-8	.98	T	:36	1.35	.36	4:00	.0277	.044
6-9	0	T	:53	.04	.37	5:12	.0707	.072
6-10	0	0	2:01	.75	.47	6:00	.185	.146
6-11	.30	0	:28	.02	.48	:48	.460	.395
6-12	3.36	1.51	:46	.23	.55	7:30	1.18	.558
6-13	.45	.12	:50	1.95	.68	:24	.533	.907
6-14	.04	.05	4:18	.07	.78	:36	.354	.994
6-15	0	.03	:24	1.20	.90	8:00	.190	1.097
6-16	.12	.02	5:03	.23	1.07	:30	.0925	1.166
6-17		.01	6:04	.55	1.58	9:00	.0453	1.199
6-18	0	.01	:09	1.44	1.70	12:00m	.0105	1.255
6-19	.02	T	:32	.65	1.95			
6-20-22	0	T	:40	1.95	2.21			
6-23	.10	T	:45	1.56	2.34			
6-24	2.22	.25	:49	1.80	2.46			
6-25	.03	.03	7:00	.65	2.58			
6-26-27		.04	:16	.30	2.66			
6-28	.20 1/	.12 2/	:48	.17	2.75			
			8:40	.03	2.78			
			6-28-57	Raingage	100			
			1:02p	0	0			
			8:10		2.86			
			6-28-577	Raingage	102			
			1:05p	0	0			
			8:10		2.76			
			6-28-57	Raingage	107			
			1:10p	0	0			
			8:00		2.60			
<p>Watershed conditions: Mixed cover under conservation practice. 7.9% of the area was in corn. 20.0% of the area was in corn-meadow strips. Corn was 38" high, weeds 24" high. 15.9% of the area was in wheat-meadow strips. Wheat was 36" high and legumes and grass in wheat strips 4' high. In meadow strips, legumes, grasses and weeds were 8" high. 7.9% of the area was in permanent meadow. Legumes, grasses, and weeds were 6' high. 25.9% of the area was in pasture. Legumes and grasses were 5" high, weeds 6" high. 16.4% of the area was in woods and 6.0% in miscellaneous cover (farmsteads, roads, etc.).</p>								
<p>Notes: 1/ Rain ended about 7:30a. 2/ Runoff prior to 1:00p.</p>								





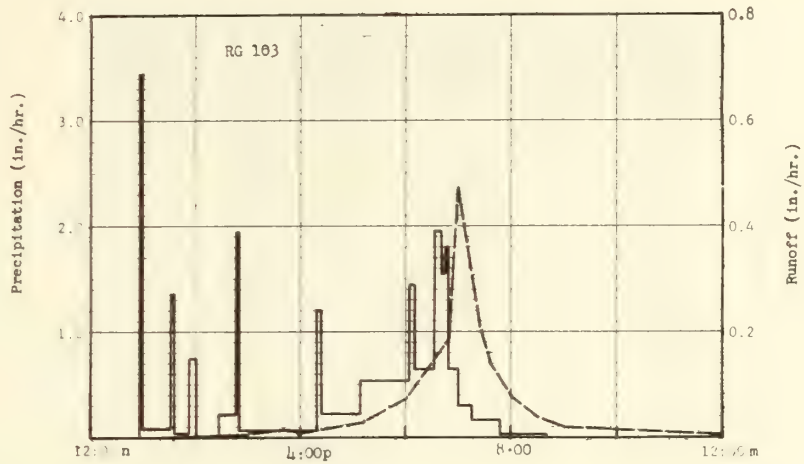


September 23, 1945

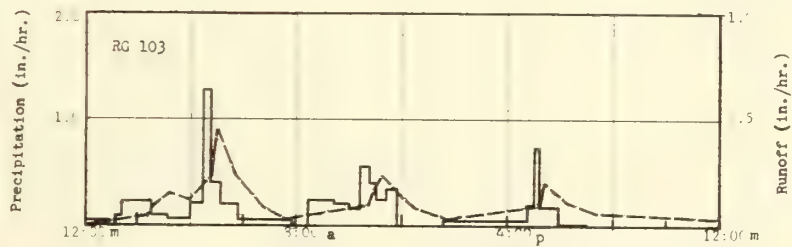


June 12, 1957

COSHOCTON, OHIO WATERSHED 177

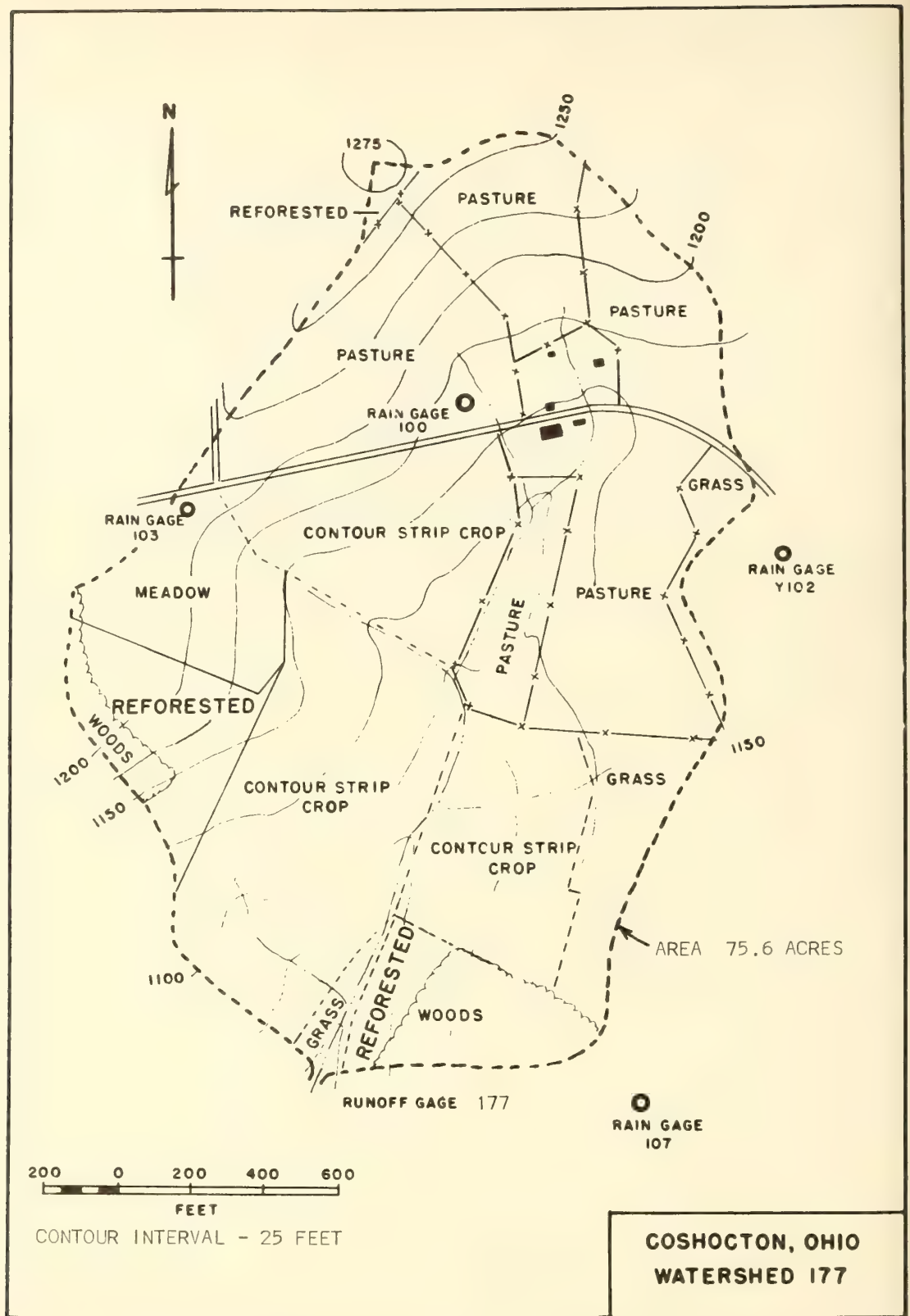


June 28, 1957



January 21, 1959

COSHOCTON, OHIO WATERSHED 177



MONTHLY PRECIPITATION AND RUNOFF (Inches)

Coshocton, Ohio watershed 183  
(Area - 74.2 acres)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1956	P 1.88 G .32	6.31 3.44	1.04 1.93	1.31 1.31	7.69 2.35	3.91 1.12	6.27 1.23	1.72 .38	1.68 .11	1.31 .01	1.33 .01	3.19 .57	16.67 12.81
1957	P 1.68 G 1.37	1.45 .86	1.87 .85	5.25 3.50	4.21 .57	9.89 3.33	4.06 .60	2.63 .09	4.33 .12	1.70 T	2.91 .26	1.29 2.36	14.27 13.71
1958	P 1.59 G .72	.76 .35	1.08 .80	3.86 1.05	3.50 1.69	4.59 .13	7.12 1.06	2.85 .61	3.19 .16	.31 T	2.12 T	.72 .01	31.99 6.36
1959	P 5.75 G 3.15	3.10 2.29	2.53 1.29	4.10 1.17	2.93 .73	3.94 .38	1.86 .27	2.42 .38	3.00 .01	5.25 .27	2.87 .75	2.27 1.60	43.02 12.29

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Coshocton, Ohio Watershed 183

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	2.50	6-12	1.01	6-12	1.11	6-12	1.18	6-28	1.26	6-28	1.39	6-28	1.50	4-3	2.54
1958	7-22	.15	7-22	.04	7-22	.11	5-4	.29	5-4	.41	5-4	.54	5-4	.69	5-3	1.33
1959	1-21	e .15		nr		nr		nr		nr		nr	1-21	e2.19	1-21	e2.68

Notes: Quality of records: monthly P, good; G, excellent; annual maximum discharges and volumes, excellent. Mixed cover 1956 to 1959; 14% woodlot, 53% grassland, 29% cultivated; prevailing practice except for 9% area strip cropped.

SELECTED RUNOFF EVENTS

Coshocton, Ohio Watershed 183

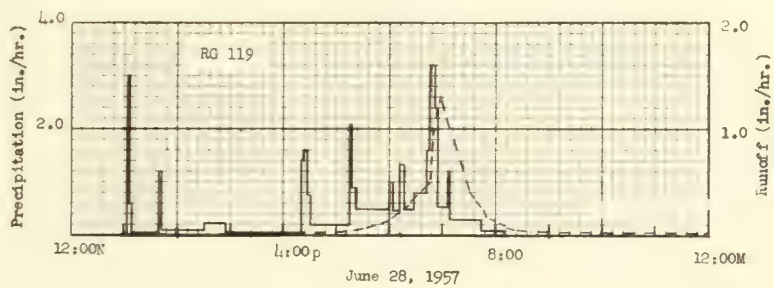
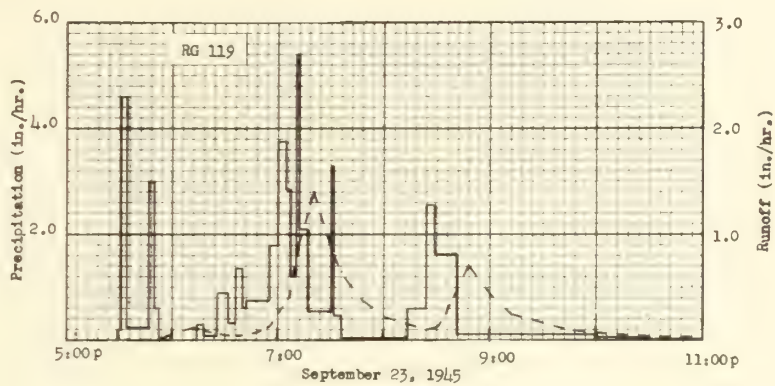
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 23, 1945								
8-23-45	0.01	0	9-23-45	Raingage	119	9-23-45		
8-24	.06	0	5:28p	0	0	5:33p	0.000855	0
8-25-31	0	0	:31	.20	.01	:53	.00521	T
9-1	.11	0	:31	4.60	.21	:57	.0461	.002
9-2-6	0	0	:47	.23	.29	6:12	.119	.027
9-7	0	T	:50	3.00	.44	:30	.0552	.050
9-8	.92	0	:52	.60	.46	:38	.0488	.057
9-9	.80	.01	6:11	0	.46	:48	.0793	.068
9-10	.77	.01	:18	.30	.48	:56	.136	.082
9-11	.01	T	:26	.08	.49	7:06	.401	.121
9-12	0	0	:32	.90	.58	:12	.929	.185
9-13	.32	0	:36	.30	.60	:20	1.411	.352
9-14	1.31	.08	:40	1.35	.69	:30	.892	.516
9-15-16	C	.01	:42	.60	.71	:36	.652	.621
9-17	.61	.01	:56	.77	.89	:48	.381	.726
9-18	1.12	.11	7:00	1.80	1.01	8:00	.219	.784
9-19	0	.01	:01	3.75	1.26	:21	.102	.841
9-20	.39	.06	:08	2.85	1.45	:30	.132	.853
9-21-22	0	.02	:10	1.20	1.49	:36	.275	.873
9-23	.35 1/	.012/	:12	5.40	1.67	:48	.710	.976
			:16	2.10	1.81	9:00	.441	1.093
			:30	.56	1.94	:12	.251	1.162
			:32	3.30	2.05	:48	.0904	1.248
			:36	.45	2.08	10:12	.0618	1.279
			8:11	.03	2.10	11:07	.0349	1.322
See next page for watershed conditions and other raingage totals.			:21	.60	2.20	12:00m	.0227	1.346
			:28	2.55	2.37			
			:41	1.62	2.72			
			10:00	.12	2.87			
			:30	.06	2.90			
			12:00m	.01	2.91			

Notes: To convert runoff in in/hr to cfs, multiply by 71.817.  
1/ Most of rainfall occurred after 3:28p.  
2/ Runoff prior to 5:33p.

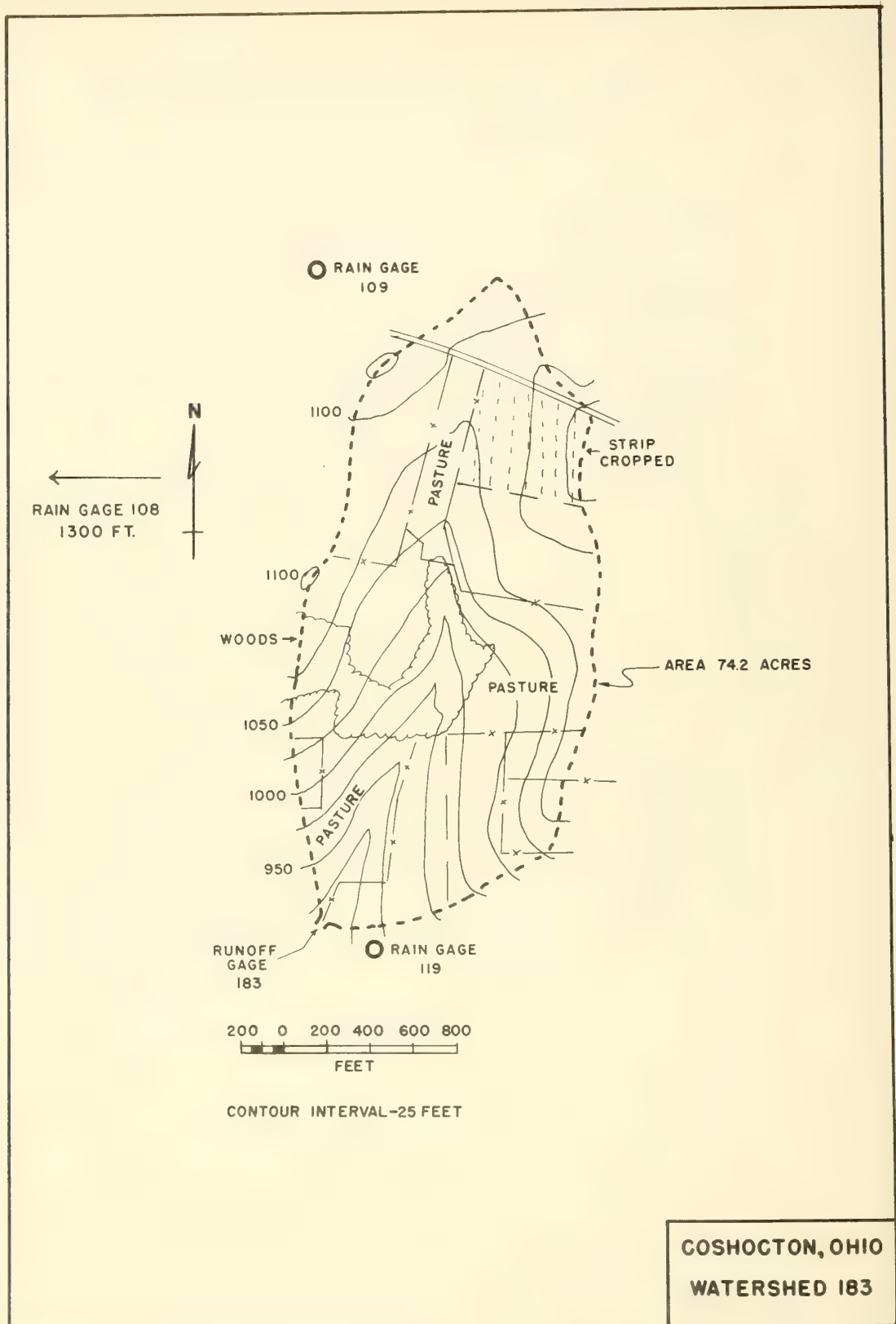
Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station



SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 183		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 23, 1945 - Continued								
Watershed conditions: Mixed cover under prevailing practice. 12.5% of the area was in corn with straight row cultivation and 8.6% in corn-meadow strips. Corn was 108" high, weeds 18" and grass 36" high. In meadow strips, legumes and grass were 6" high and weeds 12" high. 6.5% of the area was in oats going to wheat and 6.9% in oats going to meadow. 29.1% was in meadow. Grass and weeds 4" high. 22.7% of the area was in pasture. Grass 3" high, weeds 5" high. 9.2% was in pasture woodland and 3.2% in protected woodland. 1% of the area was in miscellaneous cover (farmsteads, roads, etc.).			9-23-45	Raingage	108			
			5:27p	0	0			
			10:50		2.88			
			9-23-45	Raingage	109			
				nr				
Event of June 28, 1957								
5-28-31-57	0	0.02	6-28-57	Raingage	119	6-28-57		
6-1	.06	T	1:03p	0	0	12:00n	0.00103	0
6-2-6	0	.01	:05	3.00	.10	3:00p	.00521	.010
6-7	0	0	:08	.60	.13	4:32	.0168	.024
6-8	.96	T	:39	.01	.15	5:00	.0300	.038
6-9-10	0	T	:43	1.20	.23	:30	.0720	.061
6-11	.10	.01	2:29	.07	.28	6:00	.110	.112
6-12	2.86	1.20	:51	.22	.37	:20	.287	.179
6-13	.26	.08	4:20	.06	.46	:46	.499	.343
6-14	.02	.03	:23	1.10	.53	:48	.735	.362
6-15	0	.01	:26	1.60	.62	:50	1.00	.392
6-16	.16	.02	:30	.75	.67	:58	1.30	.519
6-17-18	0	.02	5:14	.20	.82	7:08	1.00	.728
6-19	.02	T	:16	2.10	.89	:30	.428	.988
6-20-22	0	.01	:22	.90	.98	:36	.361	1.028
6-23	.07	T	6:00	.19	1.29	:46	.241	1.077
6-24	1.87	.29	:03	1.00	1.34	:50	.188	1.091
6-25-27	0	.06	:11	.45	1.70	8:00	.110	1.118
6-28	.181/	.015/	:16	1.32	1.51	:10	.0981	1.138
			:27	.19	1.60	:20	.0686	1.152
Watershed conditions: Mixed cover under prevailing practice. 4% of the area was in corn with straight row cultivation. Corn plants were 36" high, weeds 20" high. 7% of the area was in wheat. Wheat plants were 36" high, grass and weeds 4" high. 51% of the area was in meadow. Grasses, legumes and weeds were 6" high. 23% of the area was in pasture, 14% of the area was in woods and 1% in miscellaneous cover (farmsteads, roads, etc.).			:42	.80	1.80	:40	.0434	1.171
			:45	1.60	1.88	10:40	.0202	1.225
			:51	3.20	2.20	12:00m	.0168	1.249
			:55	2.10	2.36			
			7:05	.54	2.45			
			:08	1.20	2.51			
			:45	.28	2.68			
			8:10	.07	2.71			
			6-28-57	Raingage	108			
			1:03p	0	0			
			8:10p		2.90			
			6-28-57	Raingage	109			
			1:05p	0	0			
			8:10p		2.80			
Notes:								
1/ Rain ended about 7:30a.								
2/ Runoff prior to 12:00n.								
Events of June 12, 1957 and Jan. 21, 1959 could not be presented because of faulty records.								



COSHINGTON, OHIO      WATERSHED 183



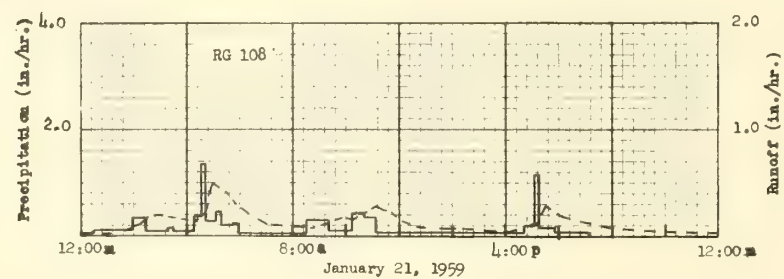
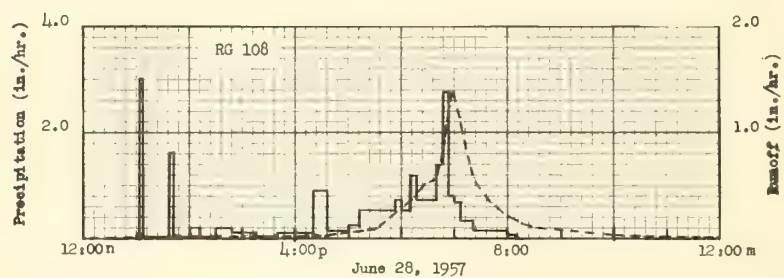
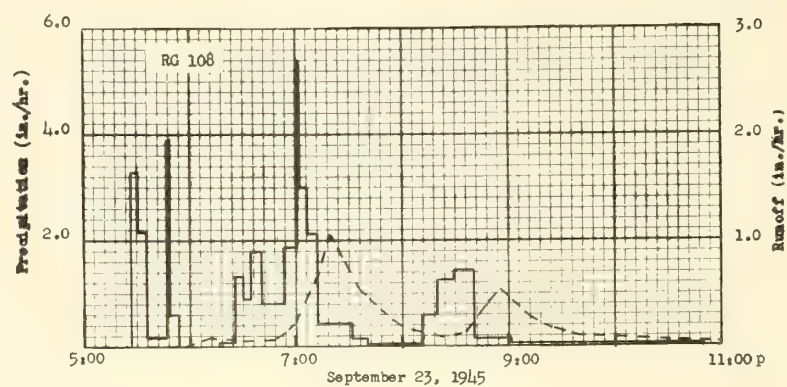
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 196 (Area - 303 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.71	5.69	3.89	1.03	7.12	1.15	6.15	1.10	1.60	1.18	1.53	3.12	15.77		
	R	.37	1.16	3.67	2.75	3.78	1.73	1.90	.63	.22	.12	.13	.97	20.13		
1957	P	1.88	1.12	1.81	5.01	1.11	10.25	3.86	2.21	1.15	1.55	2.80	1.13	43.10		
	R	1.90	1.12	1.18	1.19	1.19	1.58	.86	.26	.31	.11	.51	3.20	19.97		
1958	P	1.17	.61	.99	3.38	3.15	1.23	1.2	2.72	2.99	.32	2.18	.71	30.80		
	R	1.07	.61	1.09	1.68	2.26	.32	1.72	.78	.25	.12	.19	.17	10.21		
1959	P	1.16	3.02	2.17	1.01	2.79	1.17	1.19	2.36	2.97	1.31	2.81	1.88	12.05		
	R	1.16	2.89	1.91	1.61	.99	.10	.26	.11	.09	.12	.98	2.05	16.37		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 196								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-12	3.72	6-12	1.31	6-12	1.11	6-28	1.55	6-28	1.67	6-28	1.80	6-28	1.91	6-28	2.22
1958	7-22	.32	7-22	.17	7-22	.23	7-22	.30	7-22	.31	7-31	.10	7-31	.11	7-30	.17
1959	1-21	.50	1-21	.13	1-21	.61	1-21	1.22	1-21	2.06	1-21	2.92	1-20	3.21	1-20	3.55
Notes: Quality of records: monthly P and R, good; annual maximum discharges and volumes, good. Mixed cover 1956 to 1959; 20% woodlot, 80% grassland, 1% cultivated, 1% miscellaneous; prevailing practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 196								
Antecedent conditions			Rainfall					Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1955																
8-23-55			8-23-55	Rainage	1.04	9-23-55										
8-24	.06		8-24 p		0	5:30p	0.000710	0								
8-25-55		.01	8-25	3.30	.22	6:30	.0279	.002								
9-1			9-1	2.16	.10	1:10	.0822	.013								
9-2-7			9-2	.16	.13	1:30	.0583	.037								
9-3			9-3	3.90	.51	1:18	.0700	.051								
9-9	.92	.01	9-9	.60	.61	1:51	.127	.063								
9-10	.79	.01	9-10	.61	.61	7:00	.250	.081								
9-11	.03	.01	9-11	.07	.62	1:12	.61	.168								
9-12	0		9-12	1.32	.73	1:19	1.06	.267								
9-13	.29		9-13	.90	.79	1:31	.701	.126								
9-14	1.29	.01	9-14	1.80	.97	1:36	.53	.189								
9-15-16			9-15	.61	1.13	1:18	.310	.580								
9-17	.53	.01	9-17	1.88	1.38	1:00	.183	.133								
9-18	1.01	.13	9-18	1.56	1.56	1:10	.133	.659								
9-19		.01	9-19	3.00	1.76	1:21	.0959	.185								
9-20	.57	.05	9-20	2.10	1.97	1:36	.139	.708								
9-21-22		.02	9-21	.12	2.11	1:18	.132	.761								
9-23	.22 1/2	.012 2/3	9-23	.15	2.13	1:56	.513	.829								
			9-23	.01	2.18	9:12	.285	.911								
			9-23	.60	2.25	1:21	.183	.191								
			9-23	1.28	2.12	1:30	.151	1.008								
			9-23	1.01	2.71	1:40	.113	1.029								
			9-23	.16	2.77	10:00	.0802	1.060								
			9-23	.06	2.88	1:20	.0612	1.081								
						11:00	.0542	1.132								
(See next page for other rainage totals and watershed conditions.)																
Notes: To convert runoff in in/hr to cfs, multiply by 1.4842. 1/ Most of rainfall occurred after 3:27p. 2/ Runoff prior to 5:30p.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station



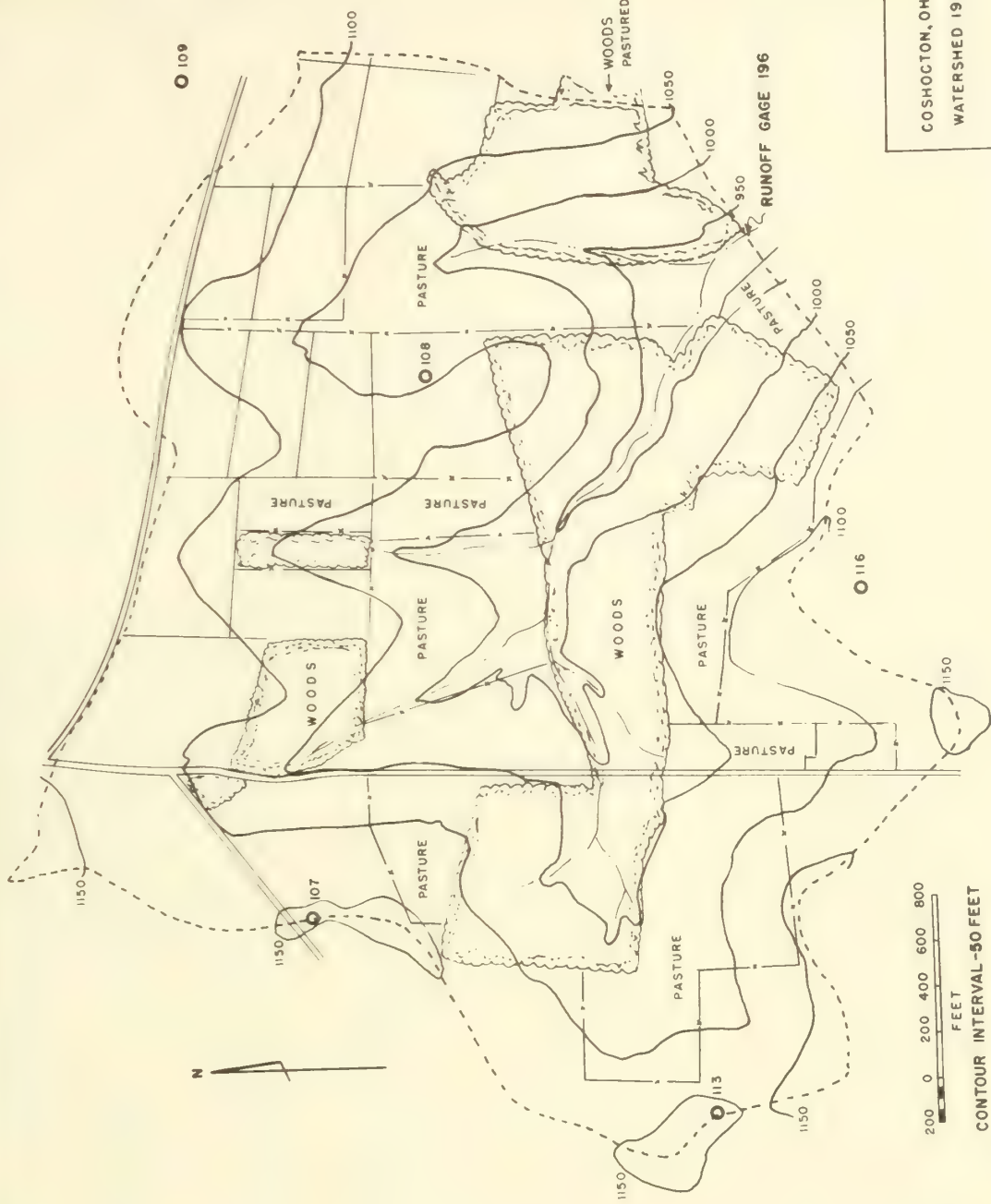
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 196		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of September 23, 1945 - Continued</u>								
<p>Watershed conditions: Mixed cover under prevailing practice. 7.2% of the area was in corn with straight row cultivation. Corn plants were 108" and weeds 48" high. 0.7% of the area was in oats which was seeded to wheat in October. Oats stubble and weeds were 3 to 4" high. 35.3% of the area was in meadow which included areas in wheat that was followed by meadow. Grass, legumes and weeds were 4" high. 24.2% of the area was in pasture. Pasture consisted mostly of timothy, poverty grass and weeds. Grass was 3" high and weeds 5" high. 26.4% of the area was in hardwood forest and 0.8% was reforested to pines. 0.7% of the area was in orchard and 4.7% in miscellaneous cover (farmsteads, roads, etc.).</p>			9-23-45	Raingage	107			
			5:25p	0	0			
			10:50p		2.75			
			9-23-45	Raingage	109			
				nr				
			9-23-45	Raingage	113			
			5:28p	0	0			
			10:32p		2.69			
			9-23-45	Raingage	116			
			5:31p	0	0			
			10:43p		2.85			
<u>Event of June 28, 1957</u>								
5-28-31-57	0	0	6-28-57	Raingage	108	6-28-57		
6-1	.10	0	1:03p	0	0	12:00n	0.0014	0
6-2-7	0	0	:07	3.00	.20	3:00p	.0118	.0115
6-8	.88	0	:38	.04	.22	:30	.0152	.0212
6-9-10	0	0	:42	1.65	.33	4:15	.0118	.0324
6-11	.35	0	2:00	.03	.34	:34	.0199	.0369
6-12	3.25	1.03	:12	.20	.38	:46	.0445	.0425
6-13	.33	0	:30	.03	.39	5:16	.0733	.0791
6-14	.02	0	:45	.20	.45	:30	.0988	.0983
6-15	0	0	3:15	.13	.51	6:16	.393	.2660
6-16	.34	0	:40	.05	.53	:26	.524	.3434
6-17-18	0	0	4:20	.12	.61	:40	.573	.4715
6-19	.02	0	:36	.90	.85	:52	1.06	.6191
6-20-22	0	0	5:00	.15	.91	:56	1.24	.6962
6-23	.06	0	:12	.25	.96	7:00	1.39	.7852
6-24	2.00	.06	:50	.54	1.30	:08	1.15	.9520
6-25-27	0	0	6:00	.72	1.42	:10	.982	.9829
6-28	.10 1/2	0	:10	.54	1.51	:25	.573	1.1793
			:17	1.20	1.65	:42	.327	1.3058
			:40	.73	1.93	:58	.226	1.3776
<p>Watershed conditions: Mixed cover under prevailing practice. 4% of the area was in corn with straight row cultivation. Corn plants were 32" high and weeds 24" high. 12% of the area was in wheat. Wheat plants were 36" high and weeds 4" high. 23% of the area was in meadow. Grass, legumes and weeds were 4" high. 28.0% of the area was in pasture. Grass and weeds were 4" high. 1.7% of the area was reforested to pines and 26.3% of the area was in hardwood forest. 5.0% of the area was in miscellaneous cover (farmsteads, roads, etc.).</p>			:46	1.40	2.07	8:16	.151	1.4327
			:54	2.78	2.44	:28	.121	1.4599
			7:00	.80	2.52	10:00	.0432	1.5660
			:07	.69	2.60	:30	.0353	1.5756
			:24	.37	2.68	12:00m	.0237	1.6293
			8:00	.17	2.79			
			:10	.06	2.80			
			6-28-57	Raingage	107			
			1:00p	0	0			
			8:00p		2.60			
			6-28-57	Raingage	109			
			1:05p	0	0			
			8:10p		2.90			
			6-28-57	Raingage	113			
			1:18p	0	0			
			8:20p		2.77			
			6-28-57	Raingage	116			
			1:02p	0	0			
			8:15p		2.89			
Notes: 1/ Rainfall ended about 7:30a.								
Event of June 12, 1957 could not be presented because of faulty record.								

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 196		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-58	0	0	1-21-59	Rain gauge	108	1-21-59		
12-22	0	0	12:01a	0	0	12:01a	0.0152	0
12-23	0	0	1:26	.05	.02	1:10	.0315	.0256
12-24	0	0	1:58	.12	.20	1:50	.0700	.0569
12-25-31	0	0	2:26	.36	.37	2:15	.121	.0957
1-1-59	.02	.04	3:18	.06	.12	3:30	.151	.1288
1-2	0	.05	3:31	.18	.16	3:50	.209	.1919
1-3	0	.03	3:18	.07	.61	3:30	.161	.3151
1-4	.02	.02	3:32	.31	.61	3:40	.151	.3913
1-5-8	0	.01	3:13	1.36	.86	3:16	.139	.4331
1-8-10	1/10	.01	4:03	.27	.95	4:12	.217	.5020
1-11-13	0	.02	4:16	.11	1.05	4:52	.115	.5561
1-14	.27	.01	4:16	.20	1.15	4:58	.501	.6036
1-15	.72	.07	4:54	.23	1.20	5:28	.119	.8166
1-16-19	.30 1/10	.07	8:28	.03	1.27	4:50	.301	.9729
1-20	.16	.05	9:23	.28	1.51	6:20	.209	1.1031
			10:13	.10	1.62	7:00	.110	1.2066
			11:13	.11	1.81	7:11	.0733	1.3183
			11:08	.36	1.99	9:16	.121	1.3972
			1:30p	.05	2.25	4:50	.167	1.5831
			5:12	.20	2.33	10:11	.151	1.5178
			5:13	1.15	2.51	11:1	.226	1.6333
			5:53	.11	2.61	11:10	.270	1.7126
			7:08	.06	2.71	12:1	.215	1.9017
						12:0	.226	1.8733
			1-21-59	Rain gauge	107			
			12:01a	0	0	12:06p	.157	1.9569
			7:23p	0	2.10	1:11	.0933	2.0417
						1:50	.0612	2.1155
			1-21-59	Rain gauge	109	2:10	.0717	2.1386
			12:01a	0	0	3:10	.0181	2.2520
			6:51p		2.73			
			1-21-59	Rain gauge	113	5:12	.121	2.3197
			12:01a	0	0	5:30	.280	2.3851
			8:06p		2.82	6:06	.183	2.5212
						8:00	.0700	2.7372
						10:00	.0396	2.8137
			1-21-59	Rain gauge	116			
			12:01a	0	0	12:00m	.0296	2.9118
			7:02p		2.11			
<p>Antecedent conditions: Mixed cover under prevailing conditions. 1.1% of the area was in forest, 1.4 in pasture and 1.1 in pasture. 14.2% was in pasture woodland, 10.1 in forested woodland and 1.1% was in forested woodland. 1.1% of the area was in miscellaneous cover. All vegetation was in dormant state. Depth of forest vegetation on all points was 1.1 ft. No forest in woodland. Snow cover on January 20.</p>								
<p>Notes: 1/ Snow 2/ Rain and snow</p>								



COSHOCKTON, OHIO      WATERSHED 196

COSHOCTON, OHIO  
WATERSHED 196

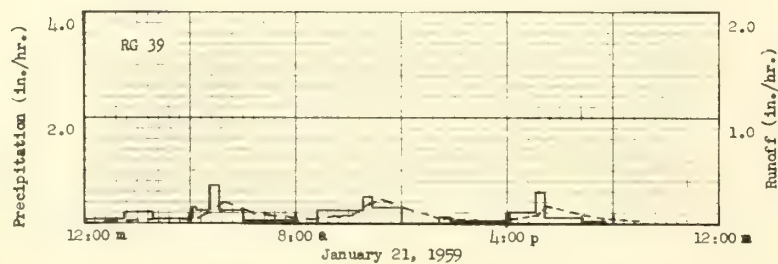
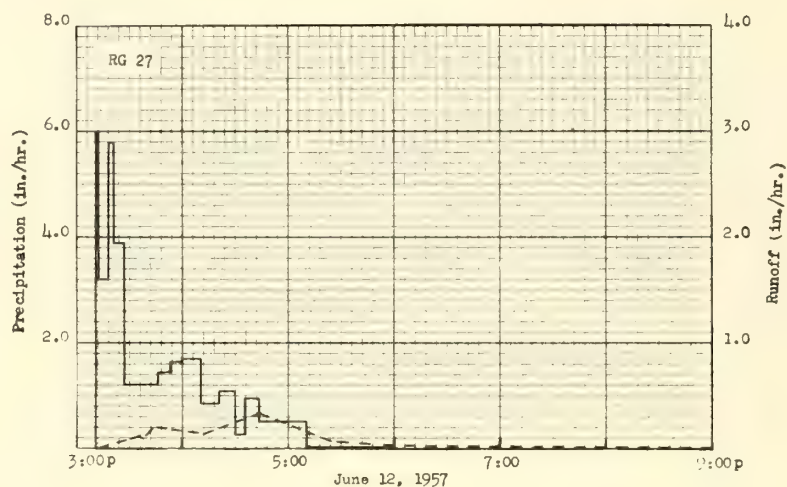
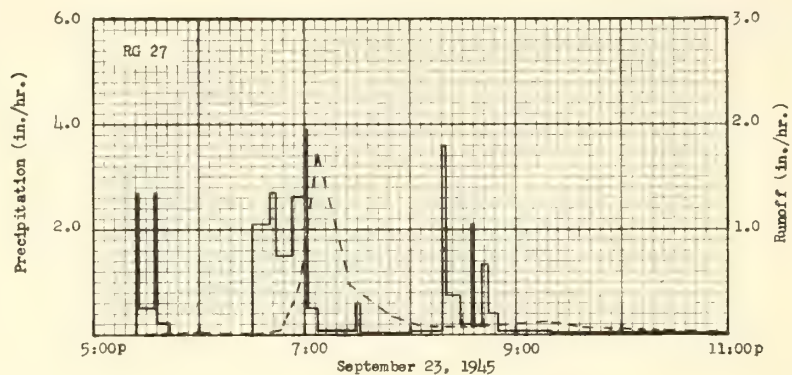




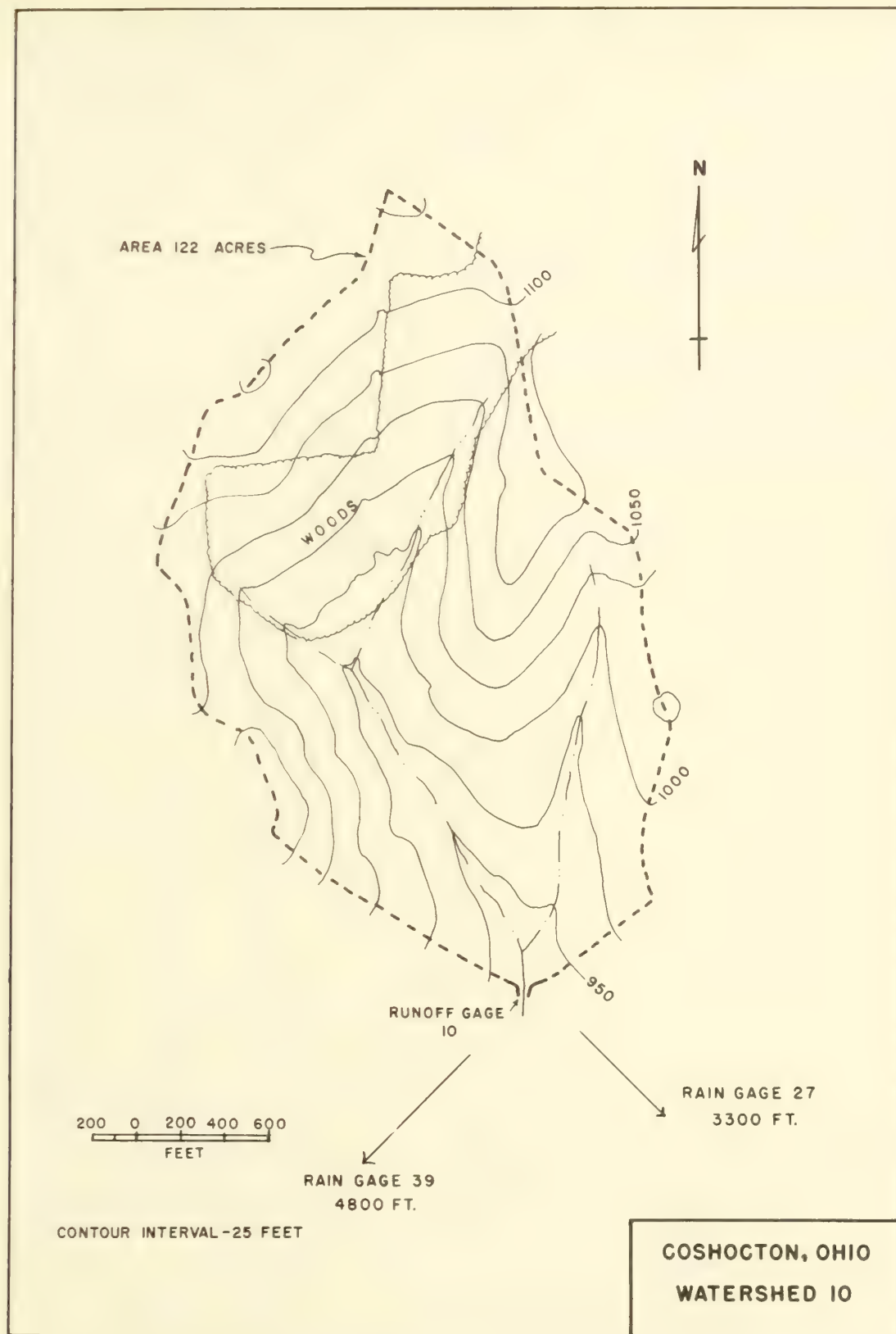
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 10 (Area - 122 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956	P 1.60 C .32	5.58 3.01	1.55 2.17	3.96 1.51	6.15 2.19	5.87 1.78	6.11 1.05	1.09 .17	1.11 .13	1.07 .11	1.53 .13	3.30 .31	15.55 13.57			
1957	P 1.80 Q 1.19	1.31 .55	1.95 .81	5.30 3.16	3.89 .67	10.08 3.60	2.96 .72	2.13 .12	3.69 .08	1.52 .09	2.70 .16	1.61 1.79	11.97 13.57			
1958	P 1.62 C .88	.71 .11	1.00 .18	3.80 1.12	3.06 1.55	1.19 .18	10.08 1.77	2.68 .56	2.79 .15	.38 .13	2.15 .16	.76 .12	33.22 7.51			
1959	P 5.91 Q 2.16	3.55 2.63	2.56 1.07	1.17 1.71	2.88 .72	1.81 .10	2.97 .12	2.10 .11	3.17 .07	5.15 .38	2.76 .76	2.22 1.33	13.15 11.79			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 10								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-28	1.76	6-28	0.98	6-28	1.39	6-28	1.80	6-28	1.99	6-28	2.11	6-28	2.25	6-21	2.79
1958	7-11	.21	7-11	.12	7-11	.17	5-11	.25	5-11	.38	5-11	.52	5-11	.66	5-3	1.16
1959	2-10	.35	2-10	.25	2-10	.35	1-21	.60	1-21	1.09	1-21	1.68	1-21	1.86	1-21	2.05
Notes: Quality of records: monthly P and C, good; annual maximum discharges and volumes, good. Mixed cover 1956 to 1959; 21% cropland, 18% grassland, 25% woodland, 6% miscellaneous; conservation practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 10								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1915																
9-23-15	T	T	9-23-15	Raingage	27	9-23-15										
9-21	.05	T	5:21 P	0	0	5:20 P	T	0								
9-20-21	0	T	:26	2.70	.09	:31	.00280	.0002								
9-20-31	0	0	:31	.52	.16	:11	.0169	.0021								
9-1	.07	0	:36	2.70	.25	:52	.0286	.0019								
9-2-7	0	0	:11	.22	.28	6:00	.0189	.0082								
9-8	.52	T	6:30	0	.28	:21	.00371	.0123								
9-9	.58	T	:10	2.10	.63	:36	.00520	.0129								
9-10	1.26	.01	:11	2.70	.81	:16	.0513	.0165								
9-11	.20	T	:52	1.50	1.01	:19	.116	.0215								
9-12	0	T	7:00	2.62	1.36	:53	.329	.0371								
9-13	.38	T	:02	3.90	1.19	:57	.501	.0612								
9-14	.95	.02	:08	.50	1.51	7:01	1.10	.1169								
9-15-16	0	T	:28	.09	1.57	:07	1.72	.2593								
9-17	.60	.01	:32	.60	1.61	:25	.185	.5677								
9-18	1.07	.01	8:00	.02	1.62	:19	.165	.6819								
9-19	0	.01	:18	.07	1.61	8:05	.0959	.7162								
9-20	.65	.02	:20	3.60	1.76	:25	.0689	.7121								
9-21	0	.01	:28	.75	1.86	:37	.0837	.7571								
9-22	0	T	:31	.20	1.88	9:17	.127	.8153								
9-23	.201	.114	:36	2.10	1.95	:25	.109	.8611								
			:10	.15	1.96	:31	.0837	.8755								
			:11	1.35	2.05	10:01	.0196	.9071								
			:50	.10	2.09	:21	.0386	.9219								
			9:20	.08	2.13	11:12	.0211	.9161								
			10:10	.01	2.18	:36	.0206	.9550								
			12:00m	.01	2.19	12:00m	.0169	.9626								
Notes: To convert runoff in in/hr to cfs, multiply by 1.4802. 1/ Most of rainfall occurred after 5:24p. 2/ Runoff prior to 5:20p.																

Cooperative Research Project of U. S. S. A. and Ohio Agricultural Experiment Station

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 10					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	.06	.01	6-12-57 3:10p	Raingage 0	27 0	6-12-57 3:00p	0	0
5-14	.90	.09	:12	6.00	.20	:08	T	.0014
5-15	.03	.01	:18	3.20	.52	:36	.127	.0157
5-16-17	0	.01	:21	5.80	.81	:38	.100	.0232
5-18	.14	.02	:27	3.90	1.20	:44	.207	.0345
5-19	.18	.02	:46	1.23	1.59	4:00	.176	.0847
5-20	.18	.03	:53	1.63	1.78	:12	.156	.1179
5-21	0	.02	4:00	1.71	1.98	:44	.329	.2308
5-22	e .52	.08	:10	.84	2.12	5:24	.0764	.3534
5-23-25	0	.07	:21	1.09	2.32	6:00	.0392	.3916
5-26	e .18	.02	:30	.27	2.36	9:20	.0120	.1549
5-27-31	0	.06	:35	.96	2.44			
6-1	.18	.01	:41	.53	2.52			
6-2-5	0	.02	5:10	.02	2.53			
6-6	.34	.01	6:00	.01	2.54			
6-7	.02	.01						
6-8	.96	.02						
6-9-10	0	.01						
6-11	.20	.01						
6-12	0	0						
Watershed conditions: Mixed cover under conservation practice. 11.7% of the area was in corn. Corn plants were 2" high and weeds 18" high. 8.0% of the area was in wheat. Wheat plants were 30" high and legumes and grass in wheat 4" high. 27.0% was in meadow. Legumes, grass and weeds were 7" high. 19.1% of the area was in pasture. Legumes and grass were 5" high and weeds 6" high. 24.2% was in woodland and 7.0% in miscellaneous cover (farmsteads and roads).								
Event of January 21, 1959								
12-21-58	0	e T	1-21-59 12:01a	Raingage 0	39 0	1-21-59 12:01a	0	0
12-22	0	e T	1:30	.06	.09	2:15	.0116	.0835
12-23	T 1/	e T	2:35	.21	.31	3:15	.0515	.1085
12-24	T 1/	e T	4:02	.07	.41	:51	.0116	.1391
12-25-31	0	e .03	:15	.32	.48	:01	.0512	.1468
1-1-59	.70	.05	:45	.24	.60	:19	.0180	.1614
1-2	0	.05	:55	.73	.88	:45	.100	.1907
1-3	0	e .03	5:08	.24	1.09	5:19	.207	.2850
1-4	.22 1/	e .02	:05	.05	1.19	6:05	.132	.1159
1-5-8	0	e .03	:05	.05	1.19	6:05	.132	.1159
1-9-10	T 1/	e .01	:10	0	1.19	:25	.0919	.1523
1-11-13	0	e .01	10:33	.25	1.62	8:35	.0116	.5676
1-14	.22 2/	e T	:51	.53	1.78	9:25	.0764	.6101
1-15	.72 2/	e .02	12:00n	.29	2.11	:35	.0689	.6223
1-16-19	.30 1/	e .02	1:25p	0	2.11	:45	.0723	.6310
1-20	e .10	e .01	:50	.14	2.17	10:05	.0689	.6576
			1:05	.02	2.22	:15	.165	.7241
			5:03	.21	2.42	11:15	.236	.8287
			:25	.60	2.64	12:25p	.109	1.0328
			6:19	.10	2.78	1:25	.0545	1.1096
			7:15	.01	2.79	3:10	.358	1.2117
						5:10	.0878	1.2768
						:30	.165	1.3190
						6:40	.0919	1.4722
						7:10	.0545	1.5433
						9:00	.0358	1.6027
Notes: 1/ Snow      Event of June 28, 1957 could not be presented because of faulty record. 2/ Rain and snow								



COSHOCTON, OHIO WATERSHED 10





MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 5 (Area - 349 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956	P Q	1.60 .18	5.58 2.72	1.55 2.15	3.96 1.53	6.15 2.91	5.87 1.60	6.11 .57	1.09 .29	1.11 .13	1.07 .01	1.53 .07	3.30 .16	15.55 12.98		
1957	P Q	1.80 .92	1.31 .73	1.95 .95	5.30 1.65	3.89 1.36	10.08 3.29	2.96 1.28	2.13 .06	3.69 .12	1.52 .06	2.70 .31	1.61 2.13	11.97 15.89		
1958	P Q	1.62 .97	.71 .18	1.00 .78	3.80 1.36	3.06 1.85	1.19 .21	10.08 2.12	2.68 .69	2.79 .20	.38 .06	2.15 .08	.76 .15	33.22 8.98		
1959	P Q	5.91 3.71	3.55 2.70	2.56 1.51	1.17 1.77	2.88 .99	1.81 .91	2.97 .25	2.10 .08	3.17 .06	5.15 .59	2.76 .92	2.22 1.67	13.15 15.19		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 5								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-28	1.09	6-28	0.77	6-28	1.01	6-28	1.38	6-28	1.58	6-28	1.71	6-28	1.91	1-3	2.68
1958	7-11	.33	7-11	.20	7-11	.29	7-11	.36	7-11	.10	5-4	.52	5-1	.69	5-3	1.31
1959	1-21	.29	1-21	.27	1-21	.15	1-21	.81	1-21	1.51	1-21	2.31	1-20	2.61	1-20	3.01
Notes: Quality of records: monthly P and C, fair; annual maximum discharges and volumes, fair. Mixed cover 1956 to 1959; 20% cropland, 51% grassland, 23% woodland, 3% miscellaneous; conservation practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 5								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1915																
8-23-15	T	T	9-23-15	Rainage	91	9-23-15										
8-21	.06	T	5:20p	0	0	6:00p	0	0								
8-25-30	0	T	:30	2.01	.31	:18	.0103	.0012								
8-31	0	T	:10	.06	.35	:51	.0639	.0069								
9-1	.06	T	6:30	0	.35	:56	.201	.0113								
9-2-7	0	.01	:38	1.28	.52	:58	.251	.0189								
9-8	.18	T	:13	.18	.56	7:00	.238	.0270								
9-9	.17	T	:50	2.32	.83	:06	.166	.0170								
9-10	1.17	.05	7:00	3.12	1.10	:13	.111	.0633								
9-11	.07	T	:05	2.01	1.57	:18	.321	.0813								
9-12	0	T	:30	.12	1.62	:36	.217	.1591								
9-13	.33	T	:35	1.20	1.72	8:00	.121	.2211								
9-14	.99	.01	8:00	.10	1.76	:26	.0929	.2701								
9-15-16	0	.01	:20	0	1.76	:10	.0861	.2913								
9-17	.60	.01	:25	2.28	1.95	9:06	.0717	.3279								
9-18	1.02	.12	:10	.36	2.01	:12	.0730	.3353								
9-19	0	.01	:17	.09	2.05	:26	.0861	.3535								
9-20	.25	.01	:50	1.60	2.13	:32	.0906	.3623								
9-21-22	0	.01	12:00m	.03	2.21	10:00	.0639	.3986								
9-23	.191	T				:30	.0392	.1211								
Watershed conditions: Mixed cover, mostly conservation practice. 8.0% of the area was in corn. Corn was cut prior to storm leaving the area in stubble. 14.5% of the area was in small grain crops mostly wheat which was cut in July and was followed by meadow. 20.0% additional of the area was in rotation meadow. Legumes and grasses were 7" high and weeds 11" high. 24.5% of the area was in pasture. Legumes, grass and weeds were 6" high. 5% of the area was in idle land which consisted mostly of grass and weeds. 14.5% of the area was in protected woodland, 9% in pastured woodland and 4.5% in miscellaneous cover (farmsteads, roads, etc.).							11:00	.0257	.1105							
							12:00m	.0133	.1589							
Notes: To convert runoff in in/hr to cfs, multiply by 351.91. 1/ Most of rainfall occurred after 3:20p.																

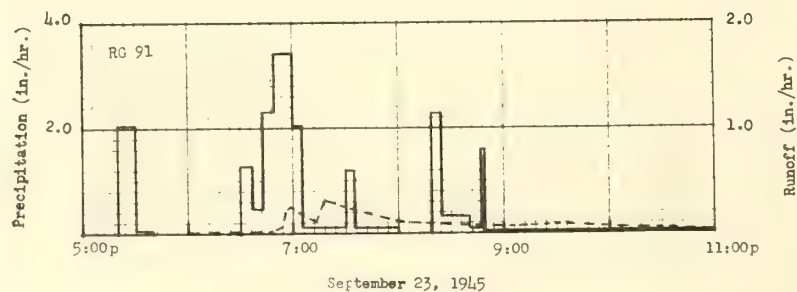
Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 5		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	.01	.02	6-12-57 3:10p	Raingage 0	27 1/2	6-12-57 3:00p	0.0002	0
5-14	.90	.13	:12	6.00	.20	4:00	.0078	.0012
5-15	.03	.10	:18	3.20	.52	:18	.0211	.0053
5-16-17	0	.1	:21	5.80	.81	:28	.0673	.0113
5-18	.11	.07	:27	3.90	1.20	:31	.166	.0233
5-19	.18	.07	:46	1.23	1.69	:38	.217	.0375
5-20	.18	.08	:53	1.63	1.78	:48	.280	.0790
5-21	0	.07	:00	1.71	1.98	:52	.355	.1001
5-22	e .52	.13	:10	.81	2.12	:56	.132	.1268
5-23-25	0	.15	:21	1.09	2.32	5:00	.106	.1517
5-26	e .18	.01	:30	.27	2.36	:00	.321	.1791
5-27-31	0	.11	:35	.96	2.11	:12	.212	.2165
6-1	.18	.02	:41	.53	2.42	:26	.166	.2613
6-2-5	0	.01	5:10	.02	2.53	:31	.135	.2811
6-6	.01	.01	6:00	.01	2.51	:46	.0995	.3080
6-7	.02	.01				6:00	.0656	.3271
6-8	.96	.03				:20	.0138	.3153
6-9-10	0	.02				:18	.0273	.3616
6-11	.20	.01				7:11	.0188	.3716
6-12	0	T				:32	.0113	.3766
						9:00	.0103	.3980
Watershed conditions: Mixed cover mostly under conservation practice. 8.5% of the area was in corn. Corn plants were 20" high and weeds 18" high. 12.0% of the area was in small grain crops, mostly wheat. Wheat plants were 30" high and legumes and grass 4" high. 19% of the area was in meadow. Legumes, grass and weeds were 7" high. 29.6% of the area was in pasture. Legumes and grass were 5" high and weeds 6" high. 5.8% was in idle land, mostly in grass and weeds. 3% of the area was in protected woodland and 19.6% in pastured woodland. 2.5% of the area was in miscellaneous cover (farmsteads and roads).								
Event of June 28, 1957								
5-28-31-57	0	0.09	6-28-57 12:50p	Raingage 0	91	6-28-57 12:00n	0.00305	0
6-1	.12	.02	1:00	.21	.01	2:21 p	.0537	.0179
6-2-5	0	.01	:15	.01	.05	:10	.0172	.0308
6-6	.10	.01	:23	1.50	.29	:56	.0639	.0166
6-7	0	.01	:40	.01	.30	:02	.0361	.1015
6-8	.90	.03	:41	.60	.31	:31	.0282	.1180
6-9-10	0	.02	:57	.05	.35	5:00	.0523	.1361
6-11	.16	.01	2:03	2.70	.62	:30	.0929	.1711
6-12	e 2.16	.12	:10	.17	.61	6:12	.166	.2596
6-13	.31	.13						
6-14	.06	.07	:33	.01	.61	:18	.510	.1230
6-15	0	.05	:50	.18	.69	7:08	1.00	.7290
6-16	.05	.01	:56	1.10	.80	:21	.711	.9861
6-17-18	0	.05	:25	.05	.88	:30	.591	1.0533
6-19	.02	.02	:31	1.10	1.02	8:01	.212	1.2657
6-20-21	0	.02	:40	.10	1.08	:28	.166	1.3118
6-22	0	.01	5:02	.19	1.15	9:00	.0929	1.4132
6-23	.12	.01	:05	1.00	1.20	:20	.0656	1.4799
6-24	2.22	.19	:20	.32	1.28	10:00	.0160	1.4769
6-25-27	0	.11	:31	.65	1.10	11:00	.0315	1.5118
6-28	.38 2/3	.01 2/3	6:00	.50	1.61	12:00n	.0250	1.5126
			:18	.77	e 1.87			
			:36	.30	e 1.96			
			:55	.85	e 2.23			
			7:01	1.87	e 2.51			
			:06	3.60	e 2.63			
			:35	.16	e 2.85			
			8:31	.11	2.96			
Watershed conditions: Mixed cover mostly under conservation practice. 8.5% of the area was in corn. Corn plants were 32" high and weeds 24" high. 12.0% of the area was in small grain crops, mostly wheat. Wheat plants were 36" high, grass and weeds 4" high. 19% of the area was in meadow. Legumes, grass and weeds were 10" high. 29.6% of the area was in pasture. Legumes and grass were 8" high. 5.8% was in idle land, mostly grass and weeds. 3% of the area was in protected woodland and 19.6% in pastured woodland. 2.5% of the area was in miscellaneous cover (farmsteads and roads).								
Notes: 1/ No intensity record on Raingage 91. Raingage 27 used. 2/ Rain ended about 7:30a. 3/ Runoff prior to 12:00n.								

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 5		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0.01	1-21-59	Raingage	91	1-21-59		
12-23	T	T	12:01a	0	0	12:01a	0.0115	0
12-24	.04 1/	T	1:15	.05	.06	2:00	.0577	.0517
12-25-31	0	.04	2:20	.19	.26	4:00	.0747	.2103
1-1-59	.71	.08	5:50	0	.26	5:15	.234	.3801
1-2-3	0	.09	3:43	.06	.31	6:30	.109	.6108
1-4	.04 1/	.03	4:30	.22	.48	8:15	.0608	.7412
1-5-8	0	.05	4:0	1.02	.65	9:15	.109	.8188
1-9-10	T 1/	.02	4:8	.15	.67	10:30	.180	.9928
1-11-13	0	.02	5:21	.56	.98	11:15	.290	1.1801
1-14	.23	.01	8:45	.06	1.18	12:00m	.180	1.3603
1-15	.69 2/	.06	9:04	.41	1.31	4:30p	.124	1.4336
1-16-19	.30 1/	.09	5:5	.13	1.42	1:00	.0995	1.4895
1-20	.49	.04	11:06	.45	1.95	3:45	.0486	1.6573
			1:40p	.07	2.13	4:45	.135	1.7198
Watershed conditions: Mixed cover mostly under conservation practice. 8.5% of the area had been in row crops. 12.0% in small grain crops. 20.0% in meadow and 29.0% in pasture. 5.4% was in idle land, 3.0% in protected woodland, 19.6% in pastured woodland and 2.5% in miscellaneous cover (farmsteads and roads). All vegetation in dormant state. Frost penetration on all areas except woodland, 1" deep. No frost in woodland. Snow cover 5" on January 20.			3:30	0	2.13	5:30	.247	1.8648
			5:00	.13	2.33	6:30	.109	2.0258
			5:05	1.92	2.49	8:00	.0591	2.1443
			4:4	0	2.49	12:00m	.0290	2.3030
			6:46	.10	2.64			
			7:30	.01	2.65			

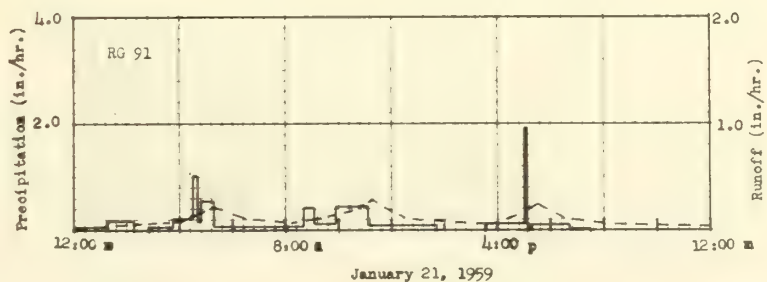
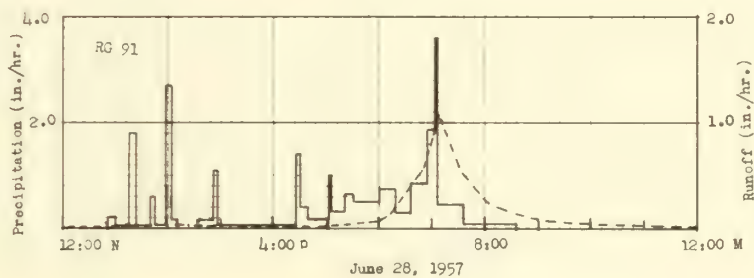
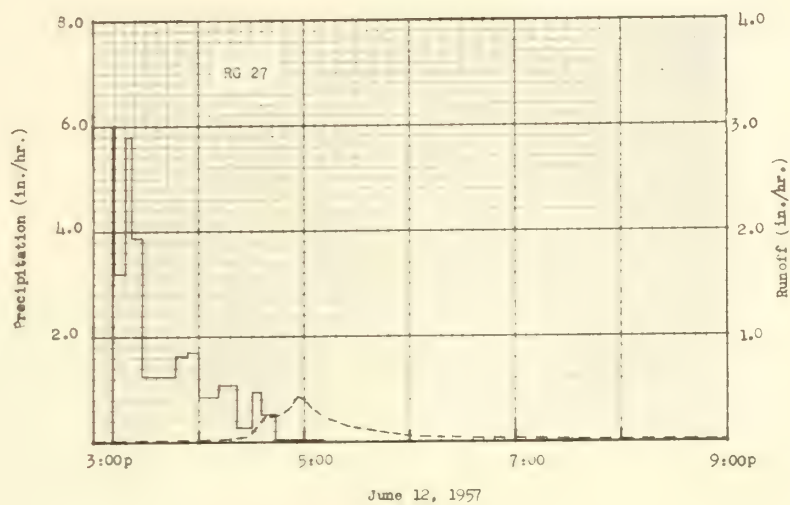
Notes: 1/ Snow

2/ Rain and Snow



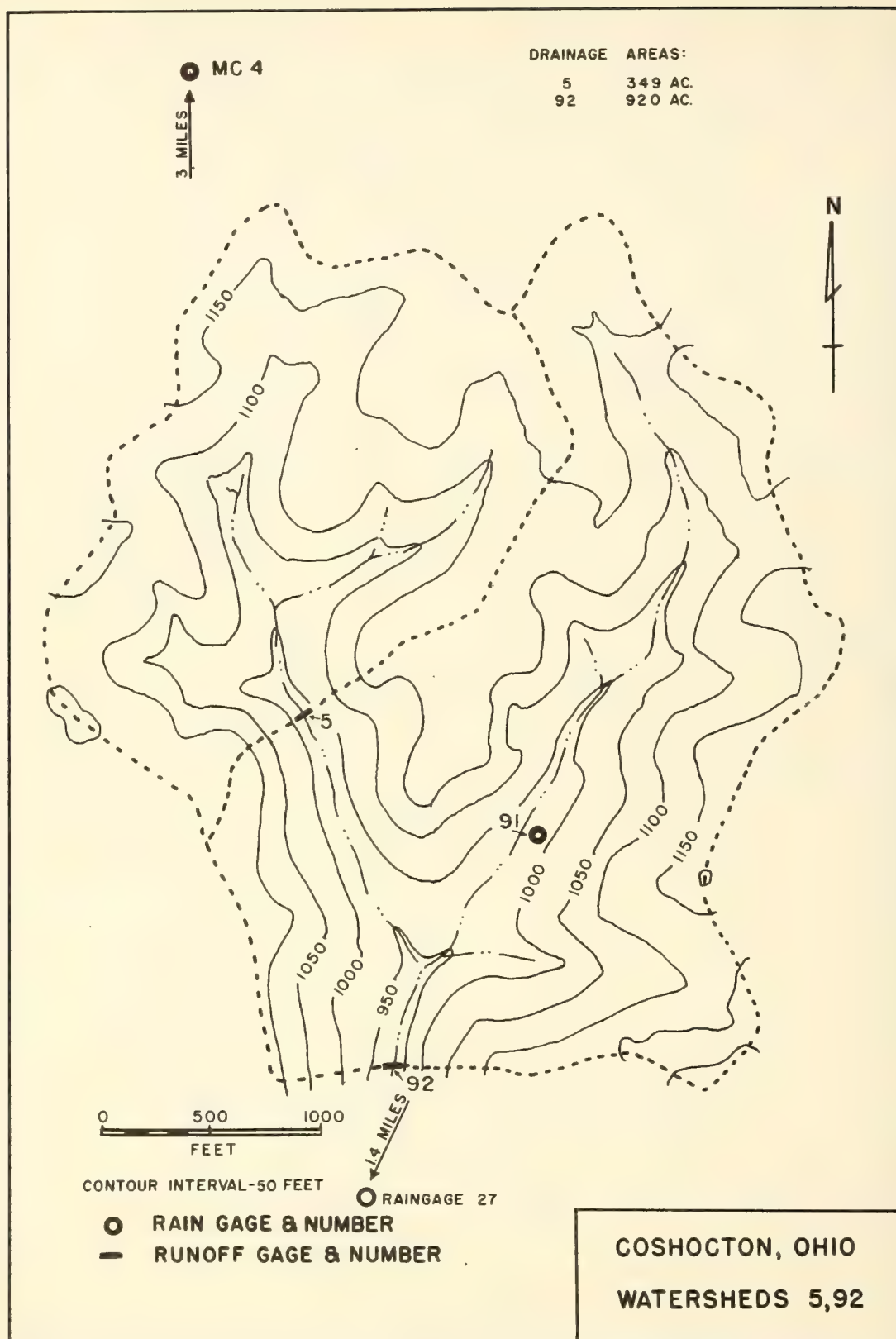
September 23, 1945

COSHOCTON, OHIO WATERSHED 5



COSHOCTON, OHIO WATERSHED 5





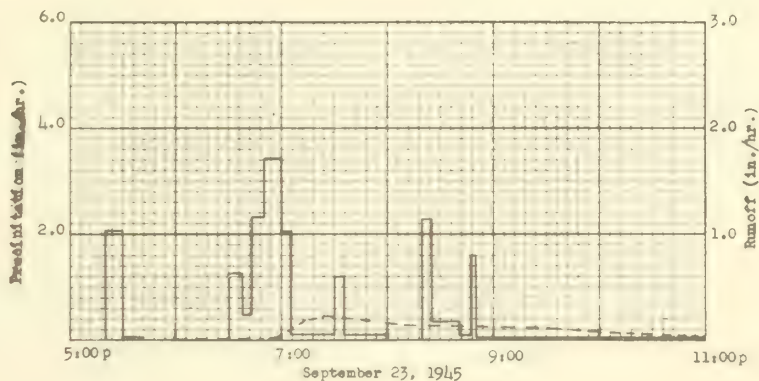
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 92 (Area - 920 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.60	1.58	4.55	3.96	6.45	5.87	6.14	4.09	1.41	1.07	1.53	3.30	45.55		
	R	.30	2.97	2.62	1.58	2.53	1.45	.60	.34	.14	.06	.08	.51	13.08		
1957	P	1.80	1.34	1.95	5.30	3.89	10.08	2.96	2.13	3.09	1.52	2.70	1.61	41.97		
	R	.99	.73	1.50	1.10	1.03	3.27	1.07	.07	.11	.05	.31	2.38	15.15		
1958	P	1.62	.71	1.00	3.80	3.06	4.19	10.08	2.68	2.79	.38	2.15	.76	33.22		
	R	1.00	.53	.82	1.53	2.08	.27	2.10	.74	.19	.06	.09	.18	9.59		
1959	P	5.91	3.55	2.56	4.47	2.88	4.81	2.97	2.10	3.47	5.45	2.76	2.22	43.15		
	R	3.83	3.17	1.63	1.93	1.08	.87	.23	.09	.07	.57	.01	1.71	16.09		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 92								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	2-28	0.62	6-28	0.52	6-28	0.82	6-28	1.24	6-28	1.14	6-28	1.61	6-28	1.79	4-3	2.64
1958	7-14	.18	7-14	.16	7-14	.23	7-14	.31	5-4	e .41	5-4	e .57	5-4	e .75	5-3	1.45
1959	2-10	.34	2-10	.27	1-21	.46	1-21	.88	1-21	1.60	1-21	2.41	1-20	2.71	1-20	3.12
Notes: Quality of records: P and R, fair; annual maximum discharges and volumes, fair. Mixed cover 1956 to 1958; 16% cropland, 30% grassland, 21% woodland, 21% miscellaneous; conservation practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 92								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	0	9-23-45	Rain gauge	91	9-23-45										
8-24	.06	0	5:20p	0	0	6:00p	0	0								
8-25-31	0	0	:30	2.0	.34	:50	.0104	.0030								
9-1	.06	0	:40	.06	.35	:57	.0316	.0054								
9-2-7	0	0	6:30	0	.35	7:00	.0567	.0076								
9-8	.07	0	:38	1.28	.52	:13	.179	.0364								
9-9	.07	0	:43	.8	.56	:25	.229	.0766								
9-10	1.47	.03	:50	2.32	.83	6:00	.153	.2062								
9-11	.07	.01	7:00	3.42	1.10	9:25	.108	.3658								
9-12	0	0	7:05	2.04	1.57	:55	.0829	.132								
9-13	.33	0	:30	.12	1.62	10:19	.0641	.128								
9-14	.99	.03	:40	1.20	1.72	:55	.064	.1739								
9-15-16	0	.31	8:00	.10	1.76	12:00m	.0235	.5077								
9-17	.60	0	:20	0	1.76											
9-18	1.02	.10	:25	2.28	1.95											
9-19	0	.02	:40	.36	2.04											
9-20	.25	.02	:47	.09	2.05											
9-21-22	0	.02	:48	1.60	2.13											
9-23	.19 1/2	.01 2/3	12:00m	.03	2.21											
Watershed conditions: Mixed cover under conservation practice. 8.0% of the area was in corn. Corn was cut September 17, leaving area in stubble. 9.0% of the area was in small grain crops, mostly wheat which was cut in July and was followed by meadow. 25.0% additional area was in rotation meadow. Legumes and grasses were 7" high and weeds 11" high. 26.4% was in pasture. Legumes, grass and weeds were 8" high. 5.0% of the area was in idle land, mostly grass and weeds. 12.5% was in protected woodland, 10.7% in pastured woodland and 3.4% in miscellaneous cover (farmsteads and roads).																
Notes: To convert runoff in in/hr to cfs, multiply by 927.64. 1/ Most of rainfall occurred before 6:00p. 2/ Runoff prior to 6:00p.																

Cooperative Research Project of U. S. S. A. and Ohio Agricultural Experiment Station.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 92		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957								
5-13-57	.04	.02	6-12-57	Raingage	27 <sup>1/</sup>	6-12-57		
5-14	.90	.09	3:10p	0	0	3:00p	0.0003	0
5-15	.03	.06	:12	6.00	.20	4:30	.0054	.0015
5-16-17	0	.06	:18	3.20	.52	:38	.0309	.0035
			:21	5.80	.81	:40	.114	.0055
5-18	.11	.03	:27	3.90	1.20	:42	.203	.0112
5-19	.18	.04	:46	1.23	1.59	:46	.233	.0257
5-20	.18	.04	:53	1.63	1.78	:54	.259	.0584
5-21	0	.05	4:00	1.71	1.98	5:00	.282	.0855
5-22	e .52	.04	:10	.84	2.12	:14	.268	.1497
5-23-25	0	.14	:21	1.09	2.32	:30	.220	.2156
5-26	e .18	.03	:30	.27	2.36	:40	.178	.2480
5-27-31	0	.09	:35	.96	2.44	:50	.143	.2748
6-1	.18	.01	:44	.53	2.52	6:00	.114	.2960
6-2-5	0	.04	5:10	.02	2.53	:12	.0855	.3159
6-6	.04	.01	6:00	.01	2.54	:36	.0505	.3420
6-7	.02	.01				7:04	.0336	.3611
6-8	.96	.03				:40	.0235	.3771
6-9-10	0	.02				8:00	.0193	.3842
6-11	.20	.01				9:10	.0134	.4075
6-12	0	T						
Watershed conditions: Mixed cover under conservation practice. 10.0% of the area was in corn. Corn plants were 20" high and weeds 18" high. 13.5% was in small grain crops, mostly wheat. Wheat plants were 30" high and legumes and grass in wheat 4" high. 19.2% in meadow. Legumes, grass and weeds were 7" high. 20.0% was in pasture. Legumes and grasses were 5" high and weeds 6" high. 5.0% was in idle land, mostly grass and weeds. 12.1% was in protected woodland, 16.8% in pastured woodland. 3.4% was in miscellaneous cover (farmsteads and roads).								
Event of June 28, 1957								
5-28-31-57	0	0.07	6-28-57	Raingage	91	6-28-57		
6-1	.12	.01	12:50p	0	0	12:00n	0.00254	0
6-2-5	0	.01	1:00	.24	.04	2:48p	.0336	.0199
6-6	.10	.01	:15	.04	.05	3:00	.0468	.0281
6-7	0	.01	:23	1.80	.29	:36	.0505	.0589
6-8	.90	.03	:40	.04	.30	5:00	.0383	.1143
6-9-10	0	.02	:44	.60	.34	:30	.0892	.1150
6-11	.16	.01	:57	.05	.35	6:00	.164	.2083
6-12	e 2.16	.14	2:03	2.70	.62	:30	.239	.3061
6-13	.34	.15	:10	.17	.64	:48	.350	.3924
6-14	.06	.08	:33	0	.64	7:00	.453	.4724
6-15	C	.05	:50	.13	.69	:14	.623	.6043
6-16	.05	.04	:56	1.10	.80	:48	.424	.9108
6-17-18	0	.05	4:25	.05	.88	8:00	.356	.9888
6-19	.02	.02	:31	1.40	1.02	:24	.224	1.1029
6-20-22	0	.04	:40	.40	1.08	9:00	.130	1.2078
6-23	.12	.01	5:02	.19	1.15	:18	.0727	1.2859
6-24	2.22	.23	:05	1.00	1.20	11:00	.0432	1.3519
6-25-27	0	.18	:20	.32	1.28	12:00m	.0336	1.3899
6-28	.38 <sup>2/</sup>	.03 <sup>3/</sup>	:31	.65	1.40			
Watershed conditions: Mixed cover under conservation practice. 10.0% of the area was in corn. Corn plants were 20" high and weeds 18" high. 13.5% was in small grain crops, mostly wheat. Wheat plants were 30" high & legumes and grass in wheat, 4" high. 19.2% was in meadow. Legumes, grass and weeds were 7" high. 20.0% was in pasture. Legumes and grasses were 5" high and weeds 6" high. 5.0% was in idle land, mostly grass and weeds. 12.1% was in protected woodland, 16.8% in pastured woodland. 3.4% was in miscellaneous cover (farmsteads and roads).								
Notes: <sup>1/</sup> No intensity record on Raingage 91. Raingage 27 used.								
<sup>2/</sup> Rainfall ended about 7:30a. <sup>3/</sup> Runoff prior to 12:00n.								

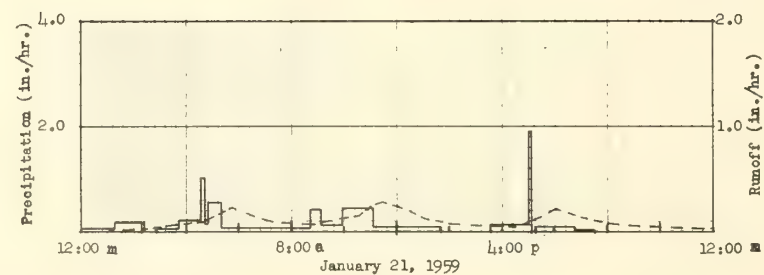
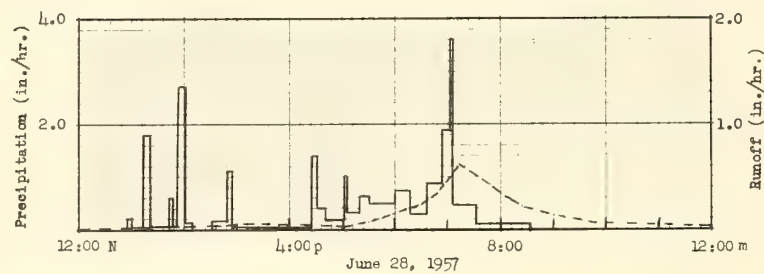
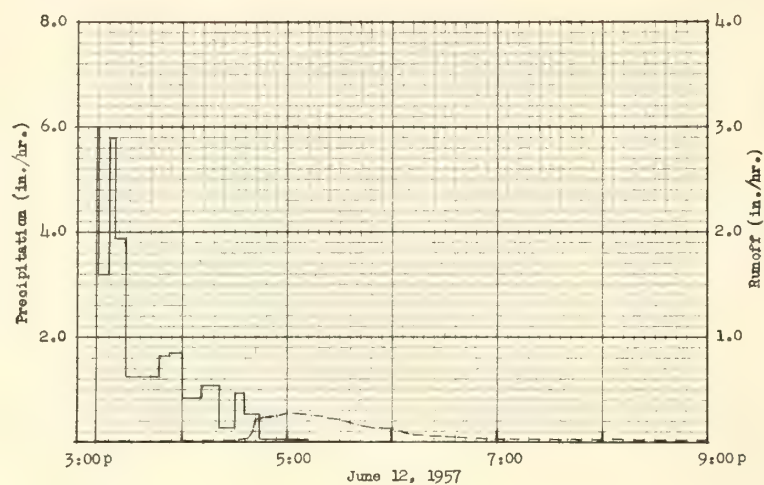
SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 92					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of January 21, 1959</u>								
12-21-22-58	0	0.01	1-21-59	Rainage	.91	1-21-59		
12-23	T	.01	12:01a	0	0	1:00a	0.0113	0
12-24	.04 1/	.01	1:15	.05	.06	2:30	.0270	.0276
12-25-31	0	.04	2:20	.19	.26	3:0	.0505	.0465
1-1-59	.71	.07	5:0	0	.26	4:42	.0993	.1978
1-2-3	0	.10	3:43	.06	.31	5:00	.147	.2340
1-4	.04 1/	.03	4:30	.22	.48	6:16	.233	.3881
1-5-8	0	.07	4:0	1.02	.65	6:36	.153	.5439
1-9-10	T	.02	4:8	.15	.67	7:18	.0993	.6336
1-11-13	0	.02	5:21	.56	.98	8:40	.0703	.7441
1-14	.23 2/	.01	8:5	.06	1.18	9:54	.0703	.7605
1-15	.69 2/	.06	9:04	.1	1.31	9:30	.108	.8117
1-16-19	.30 1/	.09	9:55	.13	1.42	10:30	.152	.9429
1-20	.49	.04	11:06	.45	1.95	11:00	.242	1.0384
			1:00p	.07	2.13	1:28	.282	1.1613
<u>Watershed conditions:</u> Mixed cover under conservation practice. 10.0% of the area had been in corn. 14.0% in small grain crops, mostly wheat, 16.7% in meadow, 20.0% in pasture, 5.0% in idle land, 12.1% in protected woodland, 16.8% in pastured woodland and 3.4% in miscellaneous cover. All vegetation in dormant state. Frost penetration on all areas except woodland, 1". No frost in woodland. Snow cover 5" on January 20.			3:30	0	2.13	12:00n	.242	1.3039
			5:00	.13	2.33	1:00p	.130	1.4779
			5:05	1.92	2.49	2:00	.0751	1.5740
			6:14	0	2.49	4:16	.0536	1.7134
			6:46	.10	2.64	5:26	.0536	1.7224
			7:30	.01	2.65	5:04	.0727	1.7610
						6:30	.139	1.8034
						6:00	.220	1.9027
						7:00	.129	2.0751
						8:00	.0802	2.1754
						10:00	.0468	2.2252
						12:00m	.0330	2.3731

Notes: 1/ Snow 2/ Rain and snow  
See map of watershed on page 26.32-5.



COSHOCOTON, OHIO WATERSHED 92





COSHOCTON, OHIO WATERSHED 92

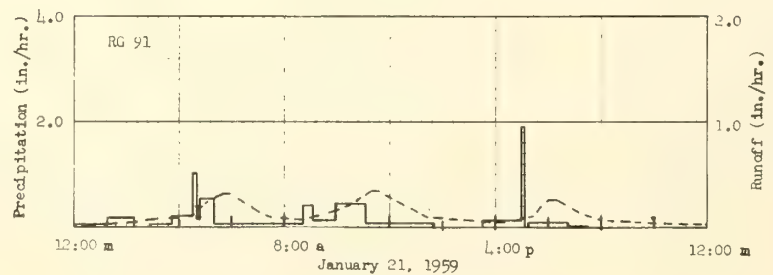
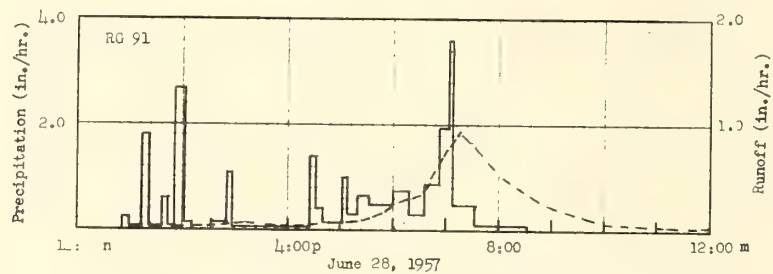
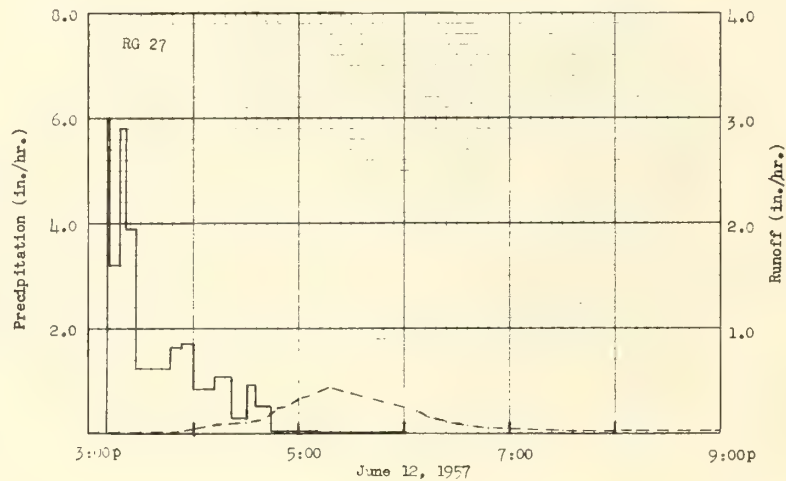
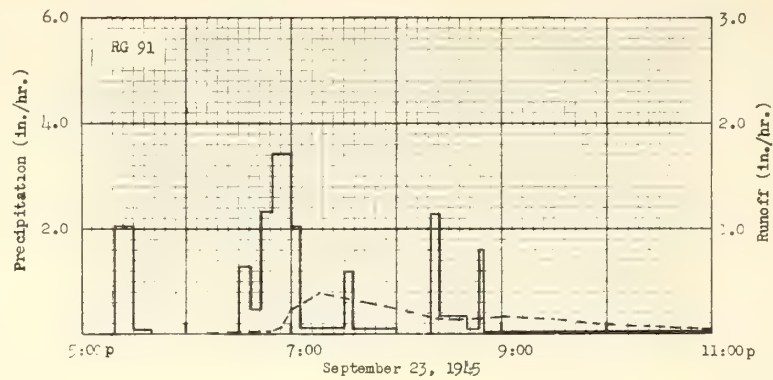
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 9½ (Area - 1520 acres)								
Month Year		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.60	5.58	1.55	3.96	6.15	5.87	6.1½	1.09	1.11	1.07	1.53	3.30	15.55		
	Q	.17	3.27	2.80	1.6½	2.56	1.65	.75	.11	.15	.05	.08	.19	11.02		
1957	P	1.80	1.3½	1.95	5.30	3.89	10.08	2.96	2.13	3.69	1.52	2.70	1.61	11.97		
	Q	1.01	.77	1.02	1.10	1.06	1.13	1.05	.11	.13	.07	.30	2.36	16.1½		
1958	P	1.62	.71	1.00	3.80	3.06	1.19	10.08	2.68	2.79	.38	2.15	.76	33.22		
	Q	1.01	.52	.86	1.17	2.16	.30	7.13	.80	.23	.09	.12	.19	10.18		
1959	P	5.91	3.55	2.56	1.17	2.88	1.81	2.97	2.10	3.17	5.15	2.76	2.22	13.15		
	Q	1.33	3.16	1.53	1.90	1.11	.87	.26	.13	.09	.58	.95	1.79	16.70		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 9½								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-28	0.92	6-28	0.77	6-28	1.22	6-28	1.79	6-28	1.99	6-28	2.16	6-28	2.32	6-21	2.91
1958	7-11	.21	7-11	.21	7-11	.30	7-11	.39	7-11	.15	5-11	.58	5-11	.76	5-3	1.53
1959	2-10	.38	1-21	.33	1-21	.60	1-21	1.13	1-21	2.01	1-21	2.95	1-20	3.27	1-20	3.67
Notes: Quality of records: monthly P and Q, fair; annual maximum discharges and volumes, fair. Mixed cover 1956 to 1959; 15% cropland, 50% grassland, 21% woodland, 14% miscellaneous; conservation practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 9½								
Antecedent conditions			Rainfall						Runoff							
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	O	9-23-45	hazage	91	9-23-45										
8-24	.06	O	5:20p	O	O	6:00p	0.00178	O								
8-25-27	O	T	:30	2.01	.31	:16	.0201	.0010								
8-28-31	O	O	:10	.06	.35	:51	.0652	.0080								
9-1	.06	O	6:30	O	.35	7:00	.217	.0216								
9-2-7	O	O	:38	1.28	.52	:16	.397	.1125								
9-8	.18	O	:13	.18	.56	:21	.366	.1635								
9-9	.17	T	:50	2.32	.83	8:00	.217	.3181								
9-10	1.17	.03	7:00	3.12	1.10	:21	.152	.126P								
9-11	.07	.01	:05	2.01	1.57	:31	.138	.1507								
9-12	O	T	:30	.12	1.62	9:00	.165	.5162								
9-13	.33	T	:35	1.20	1.72	:30	.138	.5931								
9-14	.99	.03	8:00	.10	1.76	10:00	.0909	.6501								
9-15-16	O	.01	:20	O	1.76	:21	.0686	.6811								
9-17	.60	T	:25	2.28	1.95	11:00	.0396	.7117								
9-18	1.02	.08	:10	.36	2.01	12:00	.0228	.7113								
9-19	O	.01	:17	.09	2.05											
9-20	.25	.02	:50	1.60	2.13											
9-21-22	O	.02	12:00m	.03	2.21											
9-23	.19 1/	.012/														
			9-23-45	Rainage	27											
			6:30p	O	O											
			12:00m		1.91											
Watershed conditions: Mixed cover mostly under conservation practice. 7% of the area was in corn. Corn was cut September 17, leaving area in stubble. 10% of the area was in small grain crops, mostly wheat which was followed by meadow in July. 20% additional area was in rotation meadow. Legumes and grasses were 7" high and weeds 11" high. 23.5% was in pasture. Legumes, grasses and weeds were 8" high. 5% of the area was in idle land which was mostly in grass and weeds. 19% was in protected woodland and 12% in pastured woodland. 3.5% was in miscellaneous cover (farmsteads and roads).																
Notes: To convert runoff in in/hr. to cfs, multiply by 1532.7.																
1/ Most of rainfall occurred after 3:20p. 2/ Runoff prior to 6:00p.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 94		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 12, 1957</u>								
			6-12-57	Raingage	27 1/	6-12-57		
5-13-57	.04	.02	3:10p	0	0	3:00p	0.0004	0
5-14	.90	.10	:12	6.00	.20	:16	.0102	.0027
5-15	.03	.07	:18	3.20	.52	1:00	.0186	.0073
5-16-17	0	.06	:21	5.80	.81	:08	.0771	.0159
5-18	.14	.04	:27	3.90	1.20	:30	.109	.0511
5-19	.18	.04	:46	1.23	1.59	:40	.155	.0726
5-20	.18	.05	:53	1.63	1.78	:48	.239	.0986
5-21	0	.04	1:00	1.71	1.98	:52	.267	.1156
5-22	e .52	.11	:10	.84	2.12	5:00	.324	.1547
5-23-25	0	.14	:21	1.09	2.32	:06	.366	.1891
5-26	e .18	.03	:30	.27	2.36	:17	.437	.2630
5-27-31	0	.09	:35	.96	2.44	6:08	.207	.5522
6-1	.18	.01	:44	.53	2.52	:14	.167	.5708
6-2-5	0	.04	5:10	.02	2.53	:24	.118	.5946
6-6	.04	.01	6:00	.01	2.54	:36	.0850	.6148
6-7	.02	.01				:48	.0637	.6296
6-8	.96	.03				7:08	.0426	.6170
6-9-10	0	.02				:30	.0293	.6597
6-11	.20	.01				8:00	.0231	.6727
6-12	0	.01 2/				9:00	.0158	.6916
Watershed conditions: Mixed cover mostly under conservation practice. 8% of the area was in corn. Corn plants were 20" high and weeds 18" high. 12.5% was in small grain crops, mostly wheat. Wheat plants were 30" high and legumes and grass in wheat, 4" high. 16.9% was in meadow. Legumes, grass and weeds were 7" high. 20% was in pasture. Legumes and grasses were 5" high and weeds 6" high. 6.5% was in idle land, mostly grass and weeds. 19.2% was in protected woodland and 13.4% in pastured woodland. 3.5% was in miscellaneous cover (farmsteads, roads, etc.).								
<u>Event of June 28, 1957</u>								
5-28-31-57	0	0.07	6-28-57	Raingage	91	6-28-57		
6-1	.12	.01	12:50p	0	0	12:00n	0.0026	0
6-2-5	0	.04	1:00	.24	.04	1:00p	.00225	.0026
6-6	.30	.01	:15	.04	.05	2:30	.0216	.0142
6-7	0	.01	:23	1.80	.29	3:00	.0486	.0281
6-8	.90	.03	:40	.04	.30	:10	.0620	.0374
6-9-10	0	.02	:44	.60	.34	4:00	.0471	.0845
6-11	.16	.01	:57	.05	.35	5:24	.0928	.1458
6-12	e 2.16	.73	2:03	2.70	.62	:48	.170	.1984
6-13	.34	.14	:10	.17	.64	6:00	.229	.2390
6-14	.06	.09	:33	0	.64	:30	.345	.3774
6-15	0	.05	:50	.18	.69	:48	.490	.5004
6-16	.05	.04	:56	1.10	.80	7:02	.778	.6453
6-17-18	0	.05	1:25	.05	.88	:16	.918	.8409
6-19	.02	.02	:31	1.40	1.02	:30	.824	1.0456
6-20-22	0	.04	:40	.40	1.08	8:00	.531	1.3754
6-23	.12	.01	5:02	.19	1.15	:48	.267	1.6872
6-24	2.22	.25	:05	1.00	1.20	10:00	.0719	1.8561
6-25-27	0	.18	:20	.32	1.28	:30	.0521	1.8670
6-28	.38 2/	.02 4/	:31	.65	1.40	11:10	.0390	1.9168
See next page for Watershed conditions.			6:00	.50	1.64	12:00n	.0313	1.9444
			:18	e .77	1.87			
			:36	e .30	1.96			
			:55	e .85	2.23			
			7:04	e 1.87	2.51			
			:06	e 3.60	2.63			
			:35	e .46	2.65			
			8:34	.11	2.96			
			6-28-57	Raingage	27			
			1:03p	0	0			
			8:50p		3.14			
Notes: 1/ No intensity record on Raingage 91. Raingage 27 used. 2/ Runoff prior to 3:00p. 3/ Rainfall ended 7:30a. 4/ Runoff prior to 12:00n.								

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 91		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 28, 1957 - Continued								
Watershed conditions: Mixed cover mostly under conservation practice. 8% of the area was in corn. Corn plants were 32" high and weeds 24" high. 12.5% of the area was in small grain crops, mostly wheat. Wheat plants were 36" high, grass and weeds 4" high. 16.9% was in meadow. Legumes, grass and weeds were 10" high. 20% was in pasture. Legumes and grass were 8" high. 6.5% was in idle land, mostly grass and weeds. 19.2% was in protected woodland and 13.4% in pastured woodland. 3.5% was in miscellaneous cover (farmsteads, roads, etc.).								
Event of January 21, 1959								
12-21-22-58	0	e 0.01	1-21-59	Raingage	91	1-21-59		
12-23	7	e .01	12:01a	0	0	12:20a	0.0135	0
12-24	.01 1/	e .01	1:15	.05	.06	2:20	.011	.0503
12-25-31	0	e .05	2:20	.19	.26	3:00	.0817	.0918
1-1-59	.71	e .07	:50	0	.26	4:30	.101	.2311
1-2-3	0	e .09	3:13	.06	.31	:51	.207	.2899
1-4	.3 1/	.03	4:30	.22	.18	5:06	.255	.3363
1-5-8	0	.06	:10	1.02	.65	:40	.330	.5089
1-9-10	7	1/	:18	.15	.67	:51	.330	.5859
1-11-13	0	.02	4:21	.56	.98	6:30	.217	.7630
1-1	.23	.01	8:15	.06	1.18	7:00	.155	.8660
1-15	.29 2/	.06	9:01	.1	1.31	:30	.107	.9293
1-16-19	.30 1/	.08	:55	.13	1.12	8:10	.0758	1.0332
1-20	.19	.01	11:06	.15	1.95	:16	.0758	1.0107
			1:10p	.07	2.13	10:00	.161	1.1887
			3:30	0	2.13	:30	.219	1.2798
			5:00	.13	2.33	:52	.281	1.3723
			:05	1.92	2.19	11:18	.318	1.5089
			:11	0	2.19	:36	.318	1.6133
			6:16	.10	2.61	12:30p	.223	1.8752
			7:30	.01	2.65	1:21	.101	2.0083
						2:30	.0680	2.1016
						3:00	.0507	2.1829
						:20	.0507	2.1998
						5:21	.113	2.2699
						:12	.207	2.3168
						6:00	.261	2.3692
						:20	.251	2.4172
						7:06	.155	2.6399
						8:00	.0850	2.711
						9:30	.0186	2.8377
						12:00m	.0303	2.9326
Watershed conditions: Mixed cover mostly under conservation practice. 7.5% of the area had been in corn, 13% in small grain crops, mostly wheat, 17.1% in meadow, 20% in pasture, 6% idle land, 19.2% protected woodland, 13.1% pastured woodland and 3.5% in miscellaneous cover (farmsteads and roads). All vegetation in dormant state. Frost penetration on all areas except woodland, 1" deep. No frost in woodland areas. Snow cover 5" on January 20.								
Notes: 1/ Snow								
2/ Rain and snow								

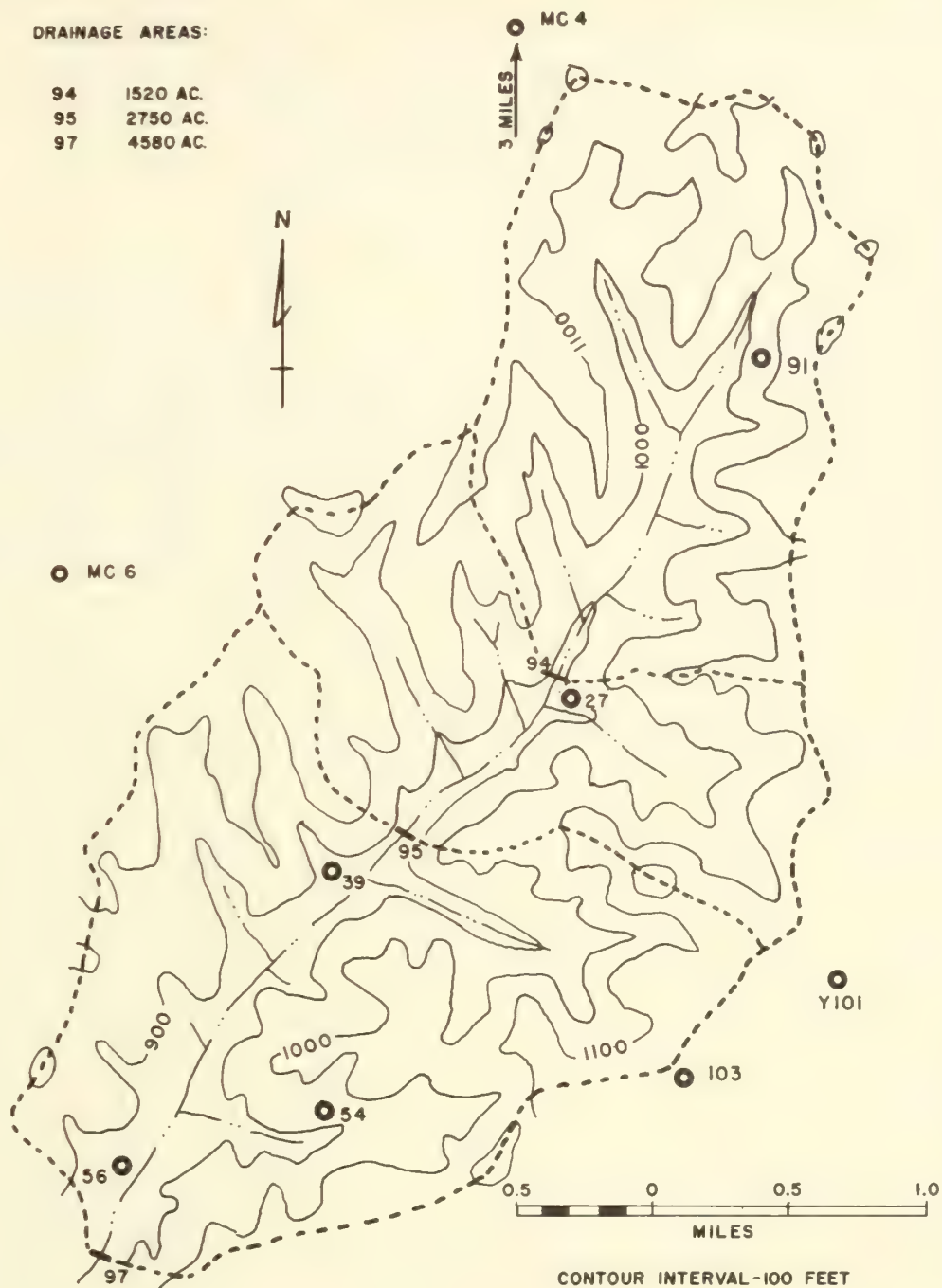




COSHOCTON, OHIO WATERSHED 94

**DRAINAGE AREAS:**

94	1520 AC.
95	2750 AC.
97	4580 AC.



○ RAIN GAGE & NUMBER  
 — RUNOFF GAGE & NUMBER

**COSHOCTON, OHIO**  
**WATERSHEDS 94,95,97**

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 95 (Area - 2570 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956	P 1.60 Q .18	5.58 3.17	4.55 2.85	3.96 1.82	6.45 2.50	5.87 1.84	6.14 .88	4.09 .41	1.41 .14	1.07 .07	1.53 .09	3.30 .53	45.55 14.48			
1957	P 1.80 Q 1.02	1.34 .83	1.95 1.07	5.30 3.85	3.89 1.00	10.08 3.84	2.96 .86	2.13 .09	3.69 .13	1.52 .07	2.70 .36	4.61 2.34	41.97 15.46			
1958	P 1.62 Q .94	.71 .51	1.00 .80	3.80 1.45	3.06 1.96	4.19 .28	10.08 2.41	2.68 .70	2.79 .21	.38 .09	2.15 .11	.76 .19	33.22 9.65			
1959	P 5.91 Q 4.17	3.55 3.07	2.56 1.49	4.47 1.73	2.88 .96	4.81 .59	2.97 .20	2.10 .13	3.47 .07	5.45 .51	2.76 .86	2.22 1.76	43.15 15.54			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 95								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-28	0.61	6-28	0.56	6-28	0.95	6-28	1.43	6-28	1.62	6-28	1.78	6-28	1.94	6-24	2.52
1958	7-14	.18	7-14	.16	7-14	.25	7-14	.33	5-4	.38	5-4	.55	5-4	.74	5-3	1.41
1959	2-10	e .43	2-10	e .36	1-21	e .60	1-21	e1.09	1-21	e1.92	1-21	e2.78	1-21	e3.07	1-20	e3.46
Notes: Quality of records: monthly P, fair; Q, good; annual maximum discharges and volumes, good. Mixed cover 1956 to 1959; 15% cropland, 55% grassland, 26% woodland, 4% miscellaneous; conservation practice.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 95								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of September 23, 1945																
8-23-45	T	T	9-23-45	Raingage	27	9-23-45										
8-24	.05	T	5:24p	0	0	6:00p	0.0005	0								
8-25-28	0	T	:26	2.70	.09	7:06	.0136	.0030								
8-29-31	0	0	:34	.52	.16	:12	.0502	.0060								
9-1	.07	0	:36	2.70	.25	:18	.0876	.0132								
9-2-7	0	0	:44	.22	.28	:24	.161	.0246								
9-8	.52	0	6:30	0	.28	:30	.338	.0473								
9-9	.58	0	:40	2.10	.63	:34	.362	.0708								
9-10	1.26	.02	:44	2.70	.81	:48	.331	.1520								
9-11	.20	.01	:52	1.50	1.01	8:00	.288	.2139								
9-12	0	T	7:00	2.62	1.36	:21	.228	.3168								
9-13	.38	T	:02	3.90	1.49	:48	.175	.3965								
9-14	.95	.03	:08	.50	1.54	9:00	.161	.1301								
9-15	0	.01	:28	.09	1.57	:32	.168	.5166								
9-16	0	T	:32	.60	1.61	10:00	.110	.5907								
9-17	.60	0	8:00	.02	1.62	:20	.102	.6314								
9-18	1.07	.08	:18	.07	1.64	:32	.0822	.6499								
9-19	0	.01	:20	3.60	1.76	:48	.0629	.6692								
9-20	.65	.03	:28	.75	1.86	11:00	.0533	.6808								
9-21	0	.02	:34	.20	1.88	12:00m	.0283	.7188								
9-22	0	.01	:36	2.10	1.95											
9-23	.20 1/	.01 2/	:40	.15	1.96											
			:44	1.35	2.05											
			:50	.40	2.09											
			9:20	.08	2.13											
			10:40	.04	2.18											
			12:00m	.01	2.19											
Notes: To convert runoff in in/hr. to cfs, multiply by 2591.4. 1/ Most of rainfall occurred after 3:24p. 2/ Runoff prior to 6:00p.																

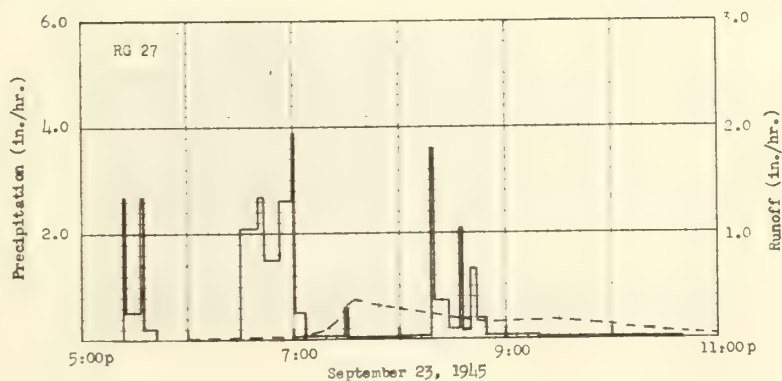
Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 95		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 23, 1945 - Continued								
			9-23-45	Rainage nr	39			
			9-23-45 6:30p 12:00m	Rainage 0	91 0 1.86			
Watershed conditions: Mixed cover mostly in conservation practice. 7% of the area was in corn. Corn cutting was completed before Sept. 23, leaving area in stubble. 7% of the area had been in small grain crops, mostly wheat which was cut in July and followed by meadow. 20.2% additional area was in rotation meadow. Legumes, grass and weeds were 7" high and weeds 11" high. 22% was in pasture. Legumes and grass and weeds were 8" high. 6% was in idle land, mostly grass and weeds. 23.1% was in protected woodland and 6.7% in pastured woodland. 4% was in miscellaneous cover (farmsteads and roads).								
Event of June 12, 1957								
5-13-57	.03	.02	6-12-57 3:10p	Rainage 0	27 0	6-12-57 3:00p	T	0
5-14	.90	.11	:12	6.00	.20	:52	.0132	.0023
5-15	.03	.07	:16	3.20	.52	4:00	.0301	.0019
5-16	0	.03	:21	5.80	.81	:12	.0919	.0166
5-17	0	.03	:27	3.90	1.20	:30	.203	.0611
5-18	.14	.03	:44	1.23	1.59	:34	.235	.0760
5-19	.16	.03	:53	1.63	1.78	:18	.292	.1382
5-20	.12	.03	4:00	1.71	1.98	5:11	.346	.2797
5-21	0	.03	:10	.84	2.12	6:02	.281	.5354
5-22	e .52	.10	:21	1.09	2.32	7:00	.0807	.7226
5-23-25	0	.13	:30	.27	2.36	8:10	.0272	.7724
5-26	e .18	.03	:35	.96	2.44	9:00	.0197	.7917
5-27-31	0	.08	:44	.53	2.52			
6-1	.18	.01	5:10	.02	2.53			
6-2-5	0	.03	6:00	.01	2.54			
6-6	.04	.01						
6-7	.02	.01						
6-8	.96	.03						
6-9-10	0	.02						
6-11	.20	.01						
6-12	0	.01 1/						
Watershed conditions: Mixed cover mostly in conservation practice. 9% in corn, plants 20" high and weeds 18" high. 11.0% in small grain crops, mostly wheat, wheat 30" high and legumes and grass 4" high. 19.0% meadow, 7" high. 19.8% in pasture, 6" high. 5.0% in idle land, 23.1% in protected woodland, 8.7% in pastured woodland and 4.4% in miscellaneous cover (farmsteads and roads).								
Notes: 1/ Runoff prior to 3:00p.								

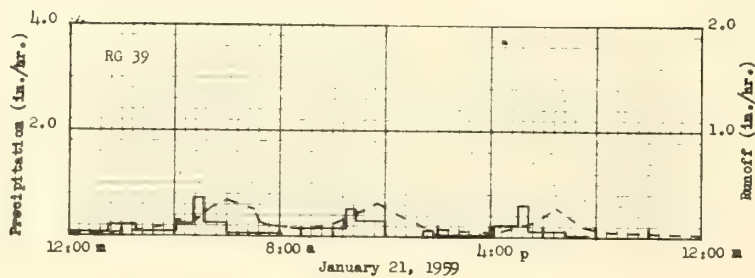
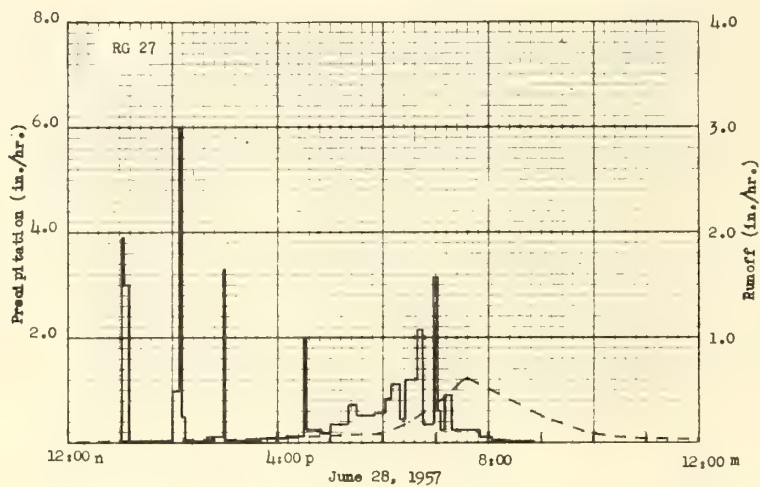
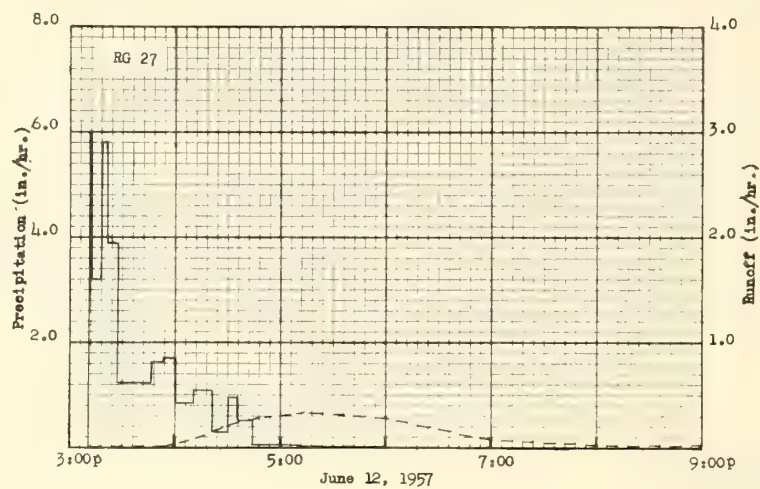


SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 95		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 28, 1957								
5-28-31-57	0	0.06	6-28-57	Raingage	27	6-28-57		
6-1	.18	.01	1:03p	0	0	12:00n	0.00238	0
6-2-5	0	.03	:05	3.90	.13	3:00p	.0279	.0176
6-6	.04	.01	:10	3.00	.38	4:00	.0421	.0558
6-7	.02	.01	2:00	.01	.39	6:00	.0942	.1131
6-8	.96	.03	:08	.98	.52	:30	.203	.2135
6-9-10	0	.02	:10	6.00	.72	7:11	.432	.4215
6-11	.20	.01	:15	.48	.76	:30	.598	.5942
6-12	2.54	.84	:40	.02	.77	:36	.614	.6548
6-13	.32	.16	:58	.10	.80	9:04	.256	1.3075
6-14	.04	.08	3:00	3.30	.91	:58	.0899	1.4634
6-15	0	.05	:40	.02	.92	10:30	.0533	1.4994
6-16	.02	.04	4:10	.08	.96	11:00	.0421	1.5229
6-17-18	0	.05	:30	.12	1.00	12:00m	.0320	1.5595
6-19	.02	.02	:33	2.00	1.10			
6-20-21	0	.03	:50	.25	1.17			
6-22	0	.01	5:00	.18	1.20			
6-23	.10	.01	:20	.36	1.32			
6-24	2.24	.25	:30	.72	1.44			
6-25	0	.10	:50	.51	1.61			
6-26-27	0	.08 2/	6:02	.55	1.72			
6-28	.26 1/	.02 2/	:10	.82	1.83			
			:17	1.11	1.96			
			:25	.45	2.02			
			:40	1.20	2.32			
			:45	2.16	2.50			
			:57	e .35	e 2.57			
			7:01	e 3.15	e 2.78			
			:05	e .60	e 2.82			
			:10	e .24	e 2.84			
			:18	e .90	e 2.96			
			:50	e .24	e 3.09			
			8:05	e .12	e 3.12			
			:20	e .04	e 3.13			
			:50	e .02	3.14			
			6-28-57	Raingage	39			
			12:50p	0	0			
			8:50		2.85			
			6-28-57	Raingage	56			
			1:19p	0	0			
			8:35		2.69			
			6-28-57	Raingage	91			
			12:50p	0	0			
			8:34		2.96			
Watershed conditions: Mixed cover mostly in conservation practice. 9.0% of the area was in corn. Corn plants were 32" high and weeds 24" high. 11.0% of the area was in small grain crops, mostly wheat. Wheat plants were 36" high, grass and weeds 4" high. 19.0% of the area was in meadow. Legumes, grass, and weeds were 10" high. 19.8% was in pasture. Legumes, grass and weeds were 8" high. 5.0% was in idle land, 23.1% in protected woodland, 8.7% in pastured woodland and 4.4% in miscellaneous cover (farmsteads and roads).								
Notes: 1/ Rainfall ended about 7:30a. 2/ Runoff prior to 12:00n.								

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 95					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21, 1959								
12-21-22-58	0	0.01	1-21-59	Rainage	.39	1-21-59		
12-23	1/	.01	12:01a	0	0	12:01a	T	0
12-24	1/	.01	1:30	.06	.09	2:36	.0448	.0186
12-25-31	0	.05	2:35	.21	.31	4:48	.143	.2139
1-1-59	.70	.07	4:02	.07	.41	5:24	.271	.3358
1-2-3	0	.12	4:15	.32	.48	6:00	.350	.5312
1-4	.02 1/	.03	4:45	.24	.60	7:00	.253	.8176
1-5-8	0	.06	5:08	.73	.88	7:12	.143	.8895
1-9	1/	.01	6:00	.24	1.09	7:36	.101	.9372
1-10	1/	.01	8:05	.05	1.19	8:54	.0687	1.0445
1-11-13	0	.02	4:48	0	1.19	10:00	.122	1.1384
1-14	.22	.01	10:33	.17	1.62	11:00	.235	1.3138
1-15	.72 2/	.05	4:51	.53	1.78	1:00	.320	1.5051
1-16-19	.30 1/	.11	12:00n	.29	2.11	12:36p	.196	1.7723
1-20	e .50	.05	1:25p	0	2.11	1:30	.0919	1.8841
			1:50	.14	2.17	3:10	.0567	2.0023
			1:05	.02	2.22	4:10	.0467	2.0535
			5:03	.21	2.42	5:36	.133	2.1421
			5:25	.60	2.64	6:04	.214	2.2262
			6:49	.10	2.78	6:26	.267	2.3233
			7:45	.01	2.79	7:10	.189	2.4933
						7:32	.101	2.5396
						8:24	.0567	2.6048
						12:00m	.0305	2.7514
Watershed conditions: Mixed cover mostly in conservation practice. 9.5% of the area had been in corn, 10.5% in wheat, 19.6% in meadow, 19.2% in pasture, 5% in idle land, 23.1% in protected woodland, 8.7% in pastured woodland and 4.4% in miscellaneous cover (farmsteads and roads). All vegetation in dormant state. Depth of frost penetration on all areas except woodland, 1" deep. No frost in woodland. Snow cover 5" on January 20.								
Notes: 1/ Snow 2/ Rain and Snow See map of watershed on page 26.34-5.								



COSHOCOTON, OHIO WATERSHED 95



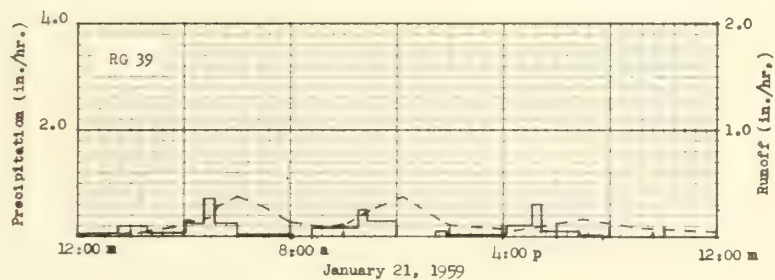
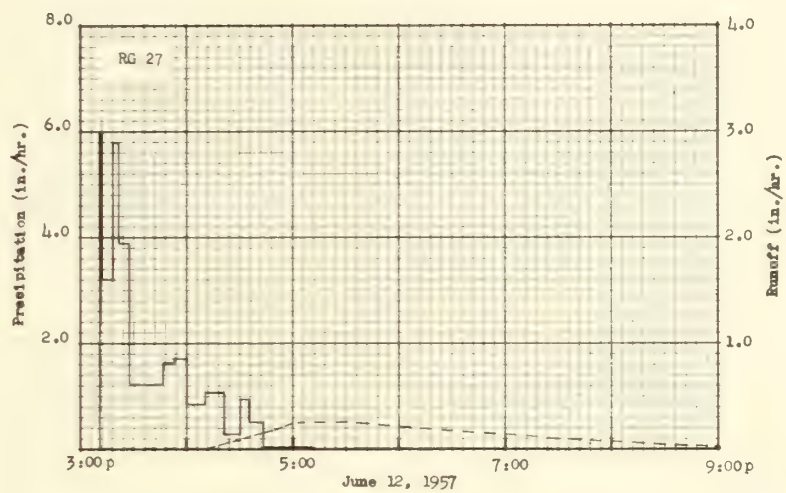
COSHOCTON, OHIO WATERSHED 95

MONTHLY PRECIPITATION AND RUNOFF (Inches)									Coshocton, Ohio Watershed 97 (Area - 4580 acres)							
Month	Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	1.60	5.58	2.55	3.96	6.15	5.87	6.14	4.09	1.41	1.07	1.53	3.30	45.55		
	R	.20	3.23	2.81	1.80	2.50	1.94	1.34	.44	.16	.06	.08	.61	15.17		
1957	P	1.80	1.34	1.95	5.30	3.89	10.08	2.96	2.13	3.69	1.52	2.70	4.61	41.97		
	R	1.12	.84	1.02	4.16	.94	4.03	.73	.08	.12	.07	.35	2.51	15.97		
1958	P	1.62	.71	1.00	3.80	3.06	4.19	10.38	2.68	2.79	.38	2.15	.76	33.22		
	R	.92	.54	.79	1.57	2.07	.27	.87	.75	.24	.09	.11	.19	9.99		
1959	P	5.91	3.55	2.56	4.47	2.88	4.81	2.97	2.10	3.47	5.45	2.76	2.22	43.15		
	R	4.52	2.65	1.33	1.81	.85	.68	.20	.21	.34	.50	.90	1.71	15.41		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS									Coshocton, Ohio Watershed 97							
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-26	2.72	6-26	0.66	6-26	1.15	6-26	1.73	6-26	1.92	6-28	2.09	6-28	2.21	6-3	2.84
1958	7-22	.11	7-22	.11	7-22	.20	7-22	.35	6-4	.18	5-4	.67	5-4	.86	5-3	1.54
1959	1-21	.37	1-21	.37	1-21	.74	1-21	1.20	1-21	2.32	1-21	3.24	1-20	3.54	1-20	3.85
Notes: Quality of records: monthly P, fair; R, good; annual maximum discharges and volumes, good. Mixed cover 1956 to 1959; 18% cropland, 50% grassland, 24% woodland, 13% miscellaneous; conservation practice.																
SELECTED RUNOFF EVENTS									Coshocton, Ohio Watershed 97							
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of June 12, 1957																
5-13-57	.11	.02	6-12-57	Rainage	27	6-12-57										
5-14	.90	.10	3:10p	0	0	3:00p	T	0								
5-15	.73	.07	:12	6.00	.20	4:10	.0124	.0015								
5-16	0	.03	:14	3.20	.52	:24	.0784	.0123								
			:21	5.80	.81	:30	.0992	.0208								
5-17	0	.03	:27	3.90	1.20	:36	.122	.0319								
5-18	.1	.03	:46	1.23	1.59	:49	.188	.0634								
5-19	.18	.03	:53	1.63	1.78	5:00	.245	.1071								
5-20	.18	.04	1:10	1.71	1.98	:30	.260	.2404								
5-21	0	.03	:10	.84	2.12	7:24	.111	.5821								
5-22	e .52	.10	:21	1.09	2.32	8:00	.0812	.6395								
5-23	0	.05	:30	.77	2.36	:36	.0437	.6786								
5-24-25	0	.06	:35	.96	2.40	9:00	.0323	.6934								
5-26	e .13	.03	:44	.53	2.52											
5-27-28	0	.04	5:10	.02	2.53											
5-29-31	0	.04	6:00	.01	2.54											
6-1	.18	.01														
6-2-5	0	.03	6-12-57	Rainage	39											
6-6	.04	.01	3:07p	0	0											
6-7	.02	.01	6:00p		2.64											
6-8	.96	.02														
6-9-10	0	.02	6-12-57	Rainage	50											
6-11	.20	.01	3:08p	0	0											
6-12	0	.01 1/2	5:30p		1.34											
See next page for Watershed conditions.																
Notes: To convert runoff in in/hr to cfs, multiply by 4618.1. 1/ Runoff prior to 3:00p.																

Cooperative Research Project of U. S. D. A. and Ohio Agricultural Experiment Station



SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 97		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12, 1957 - Continued								
<p>Watershed conditions: Mixed cover under conservation practice. 8.0% of the area was in corn and 1.0% in potatoes and soybeans. Corn plants were 20" high and weeds 18" high. 8.0% of the area was in wheat and 1.0% in other small grain crops. Wheat plants were 30" high, legumes and grass in wheat were 4" high. 21.0% of the area was in meadow. Legumes and grass were 7" high. 22.0% of the area was in pasture. Legumes, grass and weeds were 5" high. 5.0% of the area was idle land, mostly in grass and weeds. 30.0% of the area was in woodland and 4.0% in miscellaneous cover (farmsteads, roads, etc.).</p>								
Event of January 21, 1959								
12-21-58	0	0.01	1-21-59	Raingage	39	1-21-59		
12-22	0	T	12:01a	0	0	12:01a	0.0095	0
12-23	T	.01	1:30	.06	.09	2:15	.0470	.0459
12-24	T 1/	.01	2:35	.21	.31	3:45	.103	.1630
1-25-59	0	.02	4:02	.07	.41	5:00	.182	.3167
12-29-31	0	e .02	:15	.32	.48	:15	.284	.3761
1-1-59	.70	.08	:45	.21	.60	4:00	.369	.6285
1-1-3	0	.13	5:08	.73	.88	7:00	.275	.9607
1-4	.02 1/	.03	6:00	.21	1.09	8:00	.132	1.1561
1-5-6	0	.06	8:05	.05	1.19	9:05	.0942	1.2740
1-9-10	T 1/	.02	:00	0	1.19	10:00	.112	1.3688
1-11-13	0	.02	10:33	.17	1.62	11:00	.25	1.5156
1-1	.22	.01	:41	.53	1.78	12:15p	.373	1.9178
1-15	.72 2/	.06	12:00n	.29	2.11	1:30	.171	2.2593
1-16-19	.30 1/	.09	1:25p	0	2.11	2:00	.109	2.3279
1-20	e .40	.04	:50	.14	2.17	4:30	.0585	2.5131
			4:05	.02	2.22	5:30	.0992	2.5913
			5:03	.21	2.42	7:00	.166	2.7568
			:25	.60	2.64	8:00	.118	2.9371
			6:49	.10	2.78	9:00	.0844	3.0356
			7:45	.01	2.79	12:00m	.0390	3.2098
<p>Watershed conditions: Mixed cover under conservation practice. 8.0% of the area was in corn and 1.0% in potatoes and soybeans. Corn plants were 20" high and weeds 18" high. 8.0% of the area was in wheat and 1.0% in other small grain crops. Wheat plants were 30" high, legumes and grass in wheat were 4" high. 21.0% of the area was in meadow. Legumes and grass were 7" high. 22.0% of the area was in pasture. Legumes, grass and weeds were 5" high. 5.0% of the area was idle land, mostly in grass and weeds. 30.0% of the area was in woodland and 4.0% in miscellaneous cover (farmsteads, roads, etc.).</p>								
			1-21-59	Raingage	54			
			12:01a	0	0			
			7:30p	0	2.88			
			1-21-59	Raingage	56			
			12:01a	0	0			
			7:36p	0	2.63			
			1-21-59	Raingage	91			
			12:01a	0	0			
			7:30p	0	2.65			
<p>Notes: 1/ Snow 2/ Rain and snow See map of watershed on page 23.34-5.</p>								
Events of Sept. 23, 1945 and June 28, 1957 could not be presented because of faulty records.								



COSHOCTON, OHIO      WATERSHED 97

MONTHLY PRECIPITATION AND RUNOFF (Inches)									Coshocton, Ohio Watershed 994 (Area - 17,500 acres)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1956 P	1.60	5.58	4.55	3.96	6.45	5.87	6.14	4.09	1.41	1.07	1.53	3.30	45.55	
Q	.27	3.64	3.31	1.98	3.17	2.74	1.45	.46	.25	.09	.10	.63	18.09	
1957 P	1.80	1.34	1.95	5.30	3.89	10.08	2.96	2.13	3.69	1.52	2.70	4.61	41.97	
Q	1.21	1.00	1.24	4.26	1.38	4.14	.99	.10	.12	.07	.35	2.68	17.54	
1958 P	1.62	.71	1.00	3.80	3.06	4.19	10.08	2.68	2.79	.38	2.15	.76	33.22	
Q	1.11	.55	.89	1.74	2.21	.29	2.17	.74	.27	.11	.12	.22	10.42	
1959 P	5.91	3.55	2.56	4.47	2.88	4.81	2.97	2.10	3.47	5.45	2.76	2.22	43.15	
Q	4.77	3.04	1.53	1.66	.92	1.43	.47	.22	.08	.62	1.10	2.01	17.85	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS									Coshocton, Ohio Watershed 994							
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	6-28	0.44	6-28	0.43	6-28	0.81	6-28	1.71	6-28	2.16	6-28	2.39	6-28	2.64		n r
1958	7-14	.55	5-4	.55	5-4	.55	5-4	.25	5-4	.41	5-4	.59	5-4	.80		n r
1959	1-21	.25	1-21	.25	1-21	.48	1-21	1.36	1-21	2.04	1-21	3.06	1-21	3.45		n r

Notes: Quality of records: monthly P, fair; Q, good; annual maximum discharges and volumes, good. **Mixed cover 1956-59;** 15% cropland, 55% grassland, 26% woodland, 4% miscellaneous; generally under conservation practice. Runoff data furnished by the U. S. Geological Service, Columbus, Ohio.

SELECTED RUNOFF EVENTS									Coshocton, Ohio Watershed 994					
Antecedent conditions				Rainfall				Runoff						
Date	Rainfall (inches)		Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)					
<u>Event of September 23-24, 1945</u>														
8-23-45	T		T	9-23-45	Raingage 27		9-23-45							
8-24	.05		T	5:24p	0	0	5:30p	0.0017						
8-25-31	.05		T	:34	.96	.16	7:00	.0586	.0452					
9-1	.05		T	:44	.72	.28	9:00	.114	.2174					
9-2-7			T	6:30	0	.28	12:00m	.0735	.4982					
9-8	.52		T	:44	.23	.31	9-24-45							
9-9	.58		T	:52	1.50	1.81	2:00a	.0395	.6112					
9-10	1.26		.04	7:2	2.88	1.49	5:00	.0129	.6898					
9-11	.20		.02	:3	.50	1.54								
9-12			T	:2	.09	1.57								
9-13	.38		T	:32	.60	1.61								
9-14	.95		.02	8:10	.04	1.64								
9-15-16			.01	:28	1.32	1.86								
9-1	.60		T	:34	.20	1.88								
9-18	1.07		.10	:44	1.02	2.05								
9-19			.02	:50	.40	2.09								
9-20	.65		.03	10:40	.05	2.18								
9-21	0		.02	9-24-45										
9-22			.01	1:20a	.01	2.20								
9-23	.2 1/2		nr											

See next page for Watershed Conditions and other raingage totals.

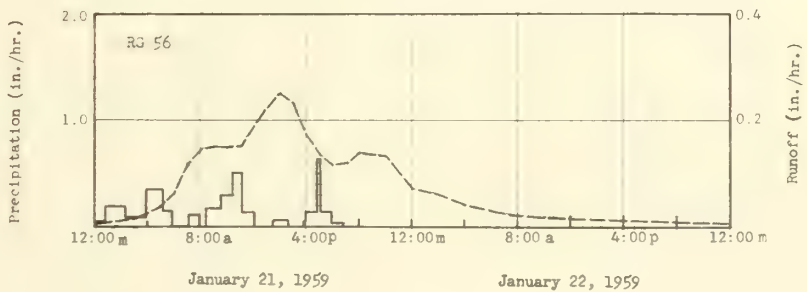
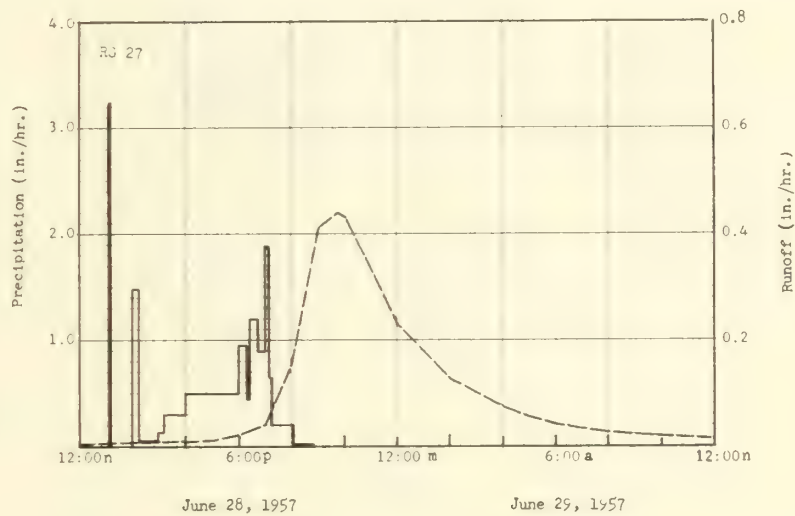
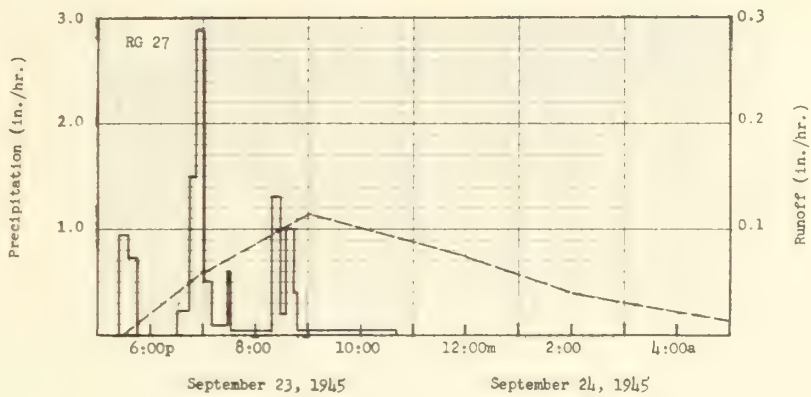
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Notes: To convert runoff in in/hr to cfs, multiply by 17646.  
1/ Most of rainfall occurred after 3:24p.





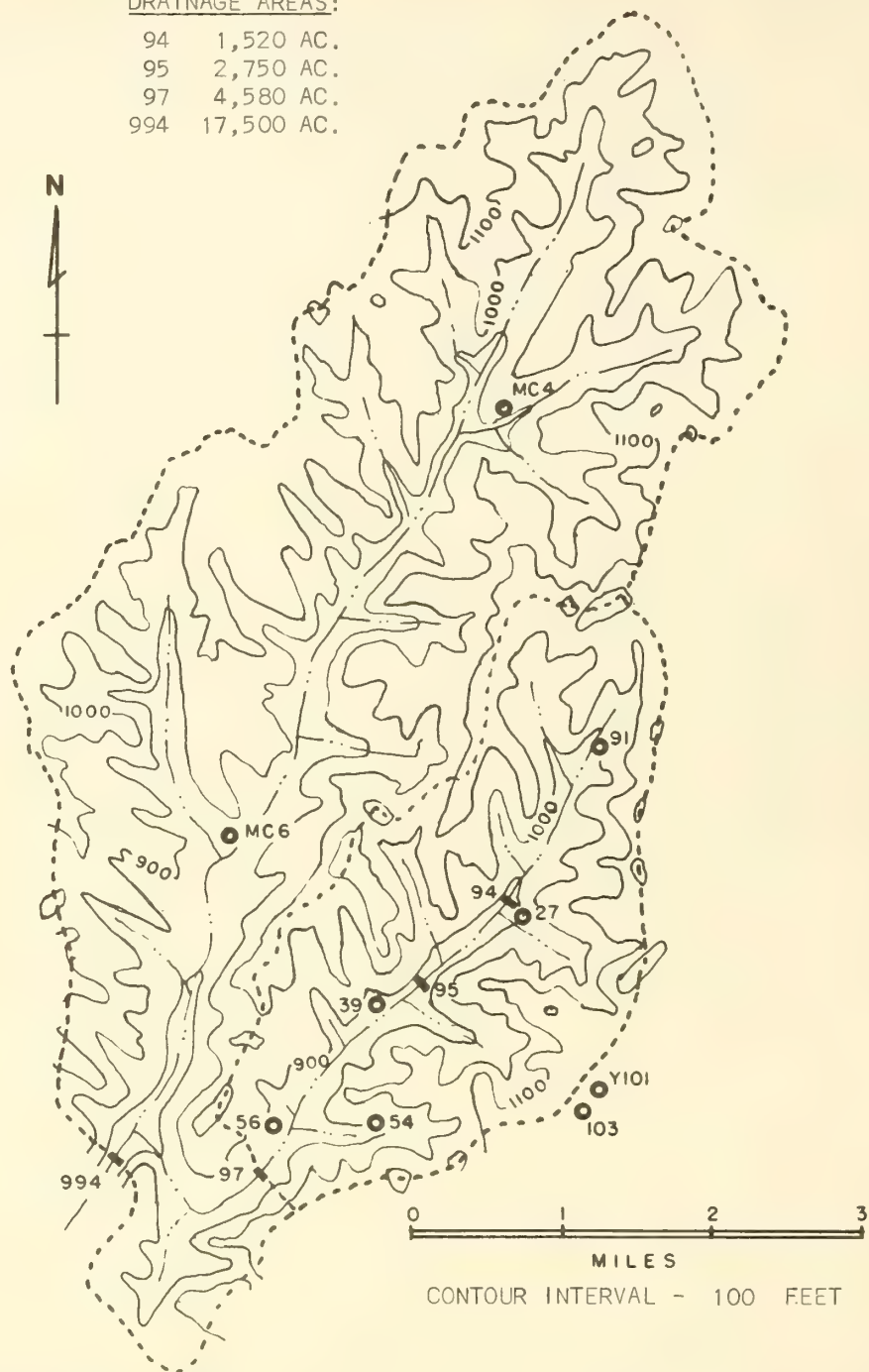
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 994		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 21-22, 1959								
12-22-58	0	.01	1-21-59	Raingage 56		1-21-59		
12-23-31	T	.07	12:01a	0	0	12:01a	0.0051	0
1-1-59	.70	.09	:50	.05	.04	1:00	.0070	.0060
1-2-3	1/	.27	2:14	.19	.30	2:00	.0103	.0147
1-4	.02 1/	.04	3:40	.08	.42	3:00	.0153	.0275
1-5-13	T	.13	5:05	.36	.93	4:00	.0248	.0475
1-14	.22	.01	:50	.15	1.04	5:00	.0380	.0789
1-15	.72 2/	.10	7:08	.02	1.07	6:00	.0622	.1290
1-16-19	.30 1/	.13	:40	.11	1.13	7:00	.1159	.2181
1-20	.40	.03	8:26	0	1.13	8:00	.1436	.3478
			9:38	.18	1.35	9:00	.1532	.4962
			10:28	.29	1.59	10:00	.1481	.6469
			11:06	.52	1.92	11:00	.1532	.7976
			12:06p	.14	2.06	1:00p	.2216	1.1725
			1:28	0	2.06	2:00	.2510	1.4088
			2:36	.06	2.13	3:00	.2334	1.6510
			3:49	0	2.13	4:00	.1758	1.8557
			4:00	.05	2.14	5:00	.1351	2.0111
			:46	.14	2.25	6:00	.1159	2.1367
			5:03	.64	2.43	7:00	.1196	2.2544
			:56	.15	2.56	8:00	.1391	2.3838
			7:36	.14	2.63	10:00	.1351	2.6580
						12:00m	.0724	2.8655
						1-22-59		
						2:00a	.0622	3.0001
			1-21-59	Raingage 27		4:00	.0415	3.1035
			12:01a	0	0	6:00	.0303	3.1753
			7:40p	e 2.98		8:00	.0226	3.2282
			1-21-59	Raingage 39		10:00	.0187	3.2695
			12:01a			12:00m	.0158	3.3040
			7:45p		2.79	2:00p	.0141	3.3339
			1-21-59	Raingage 34		4:00	.0127	3.3607
			12:01a	0		6:00	.0116	3.3850
			7:30p	e 2.83		8:00	.0103	3.4069
			1-21-59	Raingage 91		10:00	.0096	3.4268
			12:01a	0		12:00m	.0088	3.4452
			7:30p	2.65				
			1-21-59	Raingage MC-4				
			12:01a	0				
			7:26p	3.20				
			1-21-59	Raingage MC-6				
			12:01a	0				
			7:22p	2.89				
<p><u>Watershed conditions:</u> Mixed cover mostly in conservation practice. 8% of the area had been in corn, 14% in small grain crops, mostly wheat, 21% in meadow, 26.9% in pasture, 5% in idle land, 21.5% in protected woodland, 1% in pastured woodland and 2.6% in miscellaneous cover (farmsteads and roads). All vegetation in dormant state. Depth of frost penetration on all areas except woodland, 1'. No frost in woodland. Snow cover 5" on January 20.</p>								
<p>Notes: 1/ Snow</p> <p>2/ Rain and snow</p>								



COSHOCTON, OHIO WATERSHED 994

DRAINAGE AREAS:

94	1,520 AC.
95	2,750 AC.
97	4,580 AC.
994	17,500 AC.



- RAIN GAGE & NUMBER
- RUNOFF GAGE & NUMBER

**COSHOCTON, OHIO**  
**WATERSHED 994**

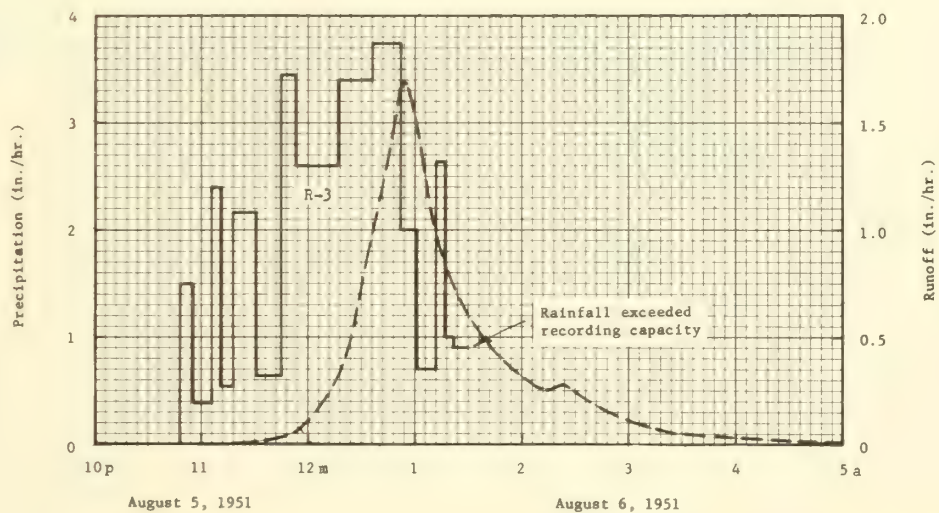
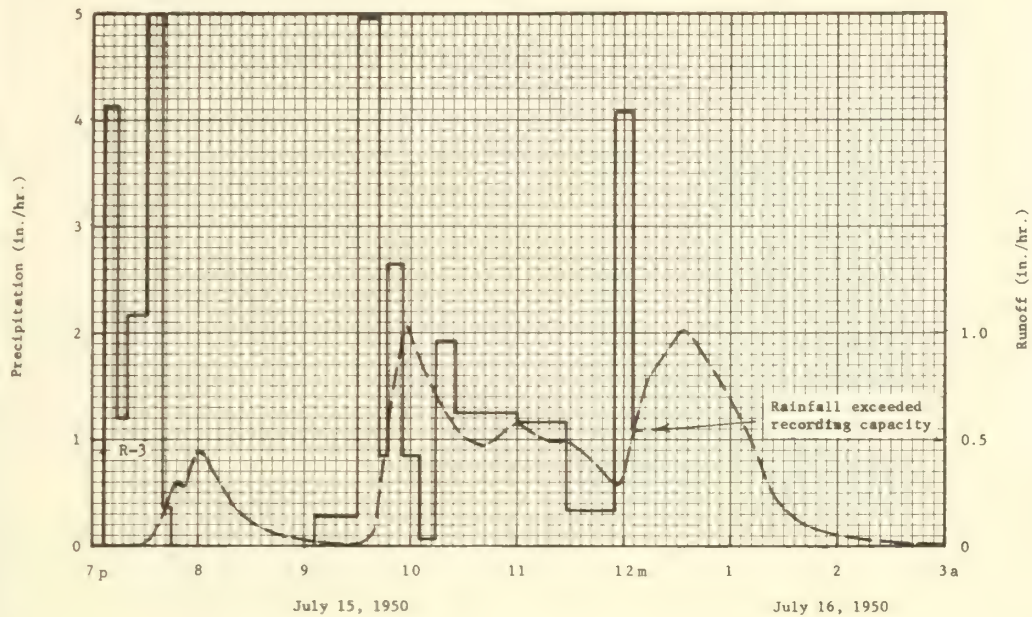
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MONTHLY PRECIPITATION AND RUNOFF (Inches)								Fennimore, Wisconsin Watershed W-1 Area - 330 acres								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	0.58 .13	0.74 .12	1.86 1.20	4.15 .16	4.76 .16	3.74 .26	3.62 .17	5.69 .24	1.58 .07	1.28 .04	3.45 .08	0.75 .03	32.20 2.66			
1957 P Q	.21 .24	.31 .34	.67 .11	1.95 .05	4.45 .04	4.62 .08	6.71 .12	3.00 .04	1.35 .03	1.60 .03	2.41 .02	1.18 .04	28.46 1.14			
1958 P Q	.28 0	.02 .26	.48 .03	2.76 .02	1.65 0	2.62 T	8.48 .01	3.60 .01	1.96 T	1.92 0	1.27 0	1.35 0	20.39 .33			
1959 P Q	.69 0	1.54 0	2.89 2.88	2.05 .40	6.26 .24	5.80 .15	2.24 .09	7.51 .21	3.07 .08	5.35 .13	2.63 .20	2.00 .21	42.03 4.59			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Fennimore, Wisconsin Watershed W-1								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	1-24	0.07	1-24	0.06	1-24	0.10	1-24	0.18	1-24	0.20	1-24	0.20	1-24	0.20	2-9	e 0.29
1958	2-23	.06	2-23	.05	2-23	.09	2-23	.16	2-23	.17	2-23	.20	2-23	.24	2-23	.26
1959	5-10	.11	5-10	.06	3-31	.10	3-31	.24	3-24	.32	3-30	.48	3-24	.79	3-24	2.29
Notes: Quality of records: P - excellent; Q - excellent, except for periods of melting snow. Watershed conditions: 16% permanent pasture; 5% roads and farmsteads; balance in corn, oats and hay.																
SELECTED RUNOFF EVENTS								Fennimore, Wisconsin Watershed W-1								
Antecedent conditions				Rainfall					Runoff							
Date	Rainfall (inches)		Runoff (inches)		Date and time	Intensity (in/hr)		Acc. (inches)		Date and time	Rate (in/hr)		Acc. (inches)			
Event of July 15-16, 1950																
6-15-50	0.28		0.003		7-15-50	Raingage		R-3		7-15-50						
6-17	.07		0		7:07p	0		0		7:05p	0		0			
6-18	.34		0		:15	4.13		.55		:30	.0109		.0006			
6-20	.34		.001		:20	1.20		.65		:34	.0339		.0020			
6-23	.47		.004		:31	2.18		1.05		:38	.0996		.0063			
6-24	0		.001		:40	5.00		1.80		:40	.140		.0103			
7-1	.58		0		:45	.36		1.83		:44	.245		.0231			
7-3	.11		0		9:06	0		1.83		:50	.299		.0514			
7-4 to 7	0		.001		:30	.28		1.94		:52	.279		.0610			
7-8 to 11	0		.001		:42	4.95		2.93		8:00	.438		.1097			
7-12	.59		T		:47	.84		3.00		:14	.278		.1949			
7-13 to 14	0		T		:55	2.63		3.35		:26	.136		.2347			
Watershed Conditions					10:05	.84		3.49		:50	.0486		.2687			
14.6% corn; 19.8% grain; 31.2% hay;					:14	.07		3.50		9:30	.0127		.2859			
28.9% pasture; 5.5% roads and buildings.					:25	1.91		3.84		:38	.0534		.2890			
					11:00	1.25		4.58		:47	.534		.3269			
					:28	1.16		5.12		:52	.840		.3869			
					:55	.33		5.27		:58	1.04		.4810			
					7-16-50					10:06	.866		.6070			
					12:05a	4.08		5.95		:24	.570		.8199			
					:10	1.08		6.04		:40	.474		.9567			
					Total 1/			7.24		11:00	.570		1.1297			
										:20	.495		1.3058			
										:30	.486		1.3875			
					7-15-50	Raingage		R-8		:56	.292		1.5569			
					7:07p	0		0		7-16-50						
					:11	4.50		.30		12:02a	.426		1.5899			
					:16	2.76		.53		:12	.738		1.6867			
					:29	1.94		.95		:14	.789		1.7121			
					:40	4.36		1.75		:26	.935		1.8848			
Notes: To convert runoff in in/hr to cfs, multiply by 332.75. 1/ Rain exceeded capacity of gage.																

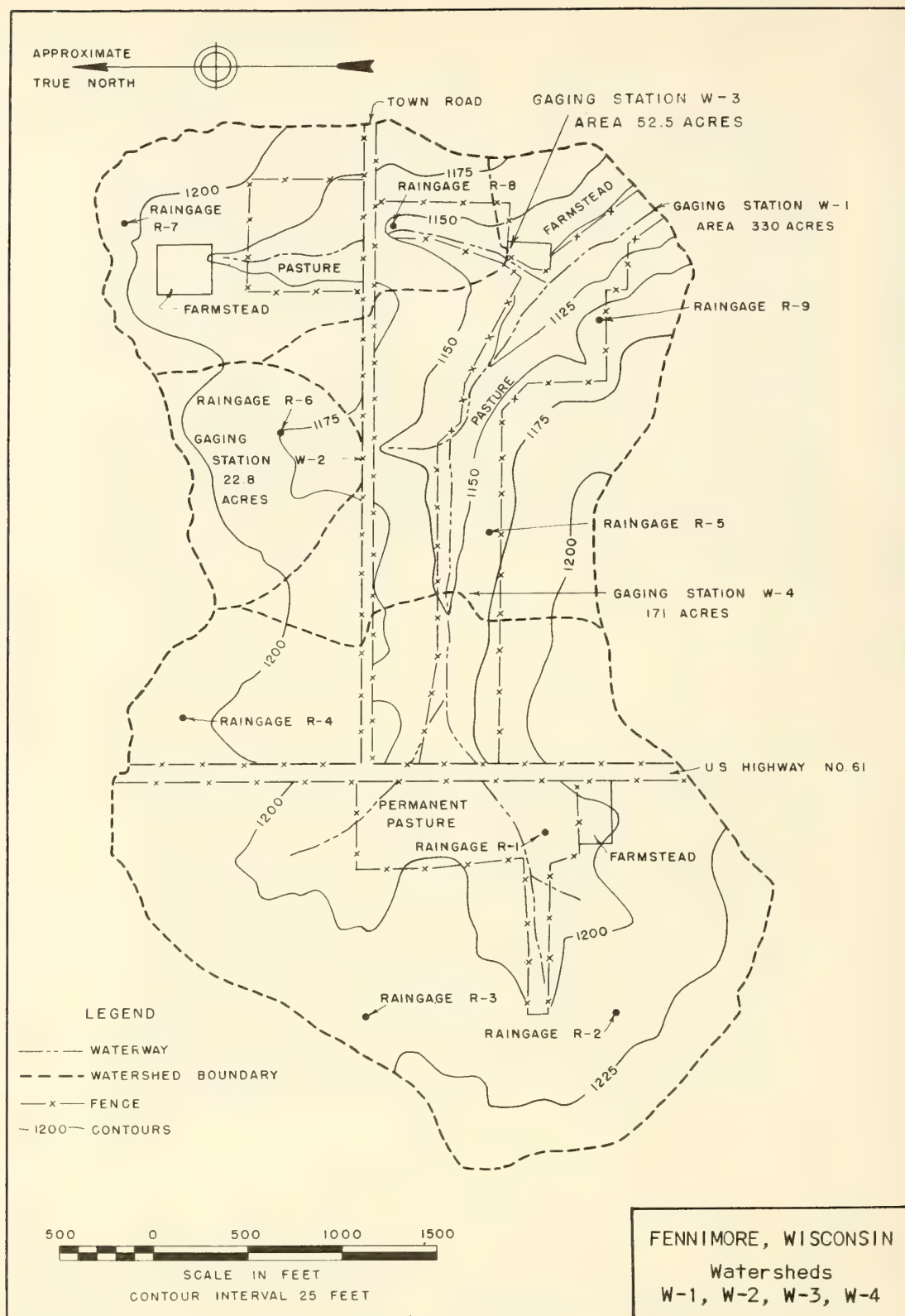
SELECTED RUNOFF EVENTS						Fennimore, Wisconsin Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 15-16, 1950 - Continued								
			7:45p	1.20	1.85	7-16-50		
			9:10	0	1.85	12:34a	1.02	2.0158
			:19	.33	1.90	:40	.962	2.1146
			:27	.08	1.91	:56	.750	2.3423
			:31	1.35	2.00	1:12	.476	2.5068
			:38	6.86	2.80	:20	.324	2.5609
			:42	4.35	3.09	:30	.170	2.6001
			:47	.48	3.13	:46	.0888	2.6332
			:54	2.48	3.42	2:10	.0411	2.6574
			:59	.36	3.45	3:00	.0100	2.6758
			10:03	.75	3.50	6:00 1/	.0009	2.6847
			:14	.05	3.51			
			11:00	1.31	4.52			
			:30	1.10	5.07			
			:53	.39	5.22			
			7-16-50					
			12:05a	3.65	5.95			
				Total 2/	7.46			
				Total	Rainfall			
				R-1	7.25			
				R-2	7.20			
				R-4	7.54			
				R-5	6.97			
				R-6	7.41			
				R-7	7.46			
				R-9	7.06			
				Watershed Average	7.29			
Event of August 4-5, 1950 - Continued								
7-8-51	2.89	.212	8-5-51	Raingage	R-3	8-5-51		
7-9	0	.014	10:48p	0	0	10:40p	.0007	0
7-10	.04	.014	:52	1.50	.10	11:30	.0123	.0020
7-11 to 12	0	.027	11:06	.39	.19	:50	.0498	.0103
7-13	.18	.013	:10	2.40	.35	8-6-51		
7-14 to 15	0	.025	:18	.53	.42	12:10a	.215	.0510
7-16	.36	.014	:32	2.18	.93	:20	.375	.0982
7-17 to 20	0	.049	:45	.64	1.07	:30	.751	.1879
7-21	.73	.017	:53	3.45	1.53	:40	1.15	.3459
7-22 to 26	0	.060	8-6-51			:50	1.54	.5685
7-27	.03	.012	12:17a	2.60	2.57	:54	1.69	.6786
7-28 to 8-4	0	.096	:36	3.41	3.65	1:00	1.54	.8417
8-5 2/	.55	.012	:52	3.75	4.65	:06	1.23	.9795
			1:01	2.00	4.95	:14	.922	1.1199
			:12	.71	5.08	:24	.691	1.2547
			:17	2.64	5.30	:32	.580	1.3393
			:20	1.00	5.35	:40	.483	1.4101
			:30	.90	5.50	:52	.366	1.4944
			2:45 4/	Total 2/	6.73	2:14	.262	1.6044
						:26	.269	1.6585
			8-5-51	Raingage	R-8	:42	.183	1.7182
			10:44p	0	0	3:00	.109	1.7615
			:49	1.44	.12	:20	.0606	1.7890
			11:01	3.00	.22	:40	.0411	1.8060
			:07	1.70	.39	4:00	.0281	1.8175
			:15	.68	.48	:30	.0164	1.8284
			:28	2.63	1.05	5:00 2/	.0100	1.8349
			:40	.75	1.20			
			:49	3.66	1.75			
			8-6-51					
			12:02a	3.23	2.45			
			:23	3.15	3.55			
			:40	3.53	4.55			
			:53	3.23	5.25			
Notes: To convert runoff in in/hr to cfs, multiply by 332.75. 1/ Base flow continued at less than 0.001 in/hr. 2/ Rain exceeded gage capacity. 3/ Prior to event beginning 10:48p. 4/ Estimated from weekly gage. 5/ Base flow continued at less than 0.01 in/hr.								

SELECTED RUNOFF EVENTS						Fennimore, Wisconsin Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 5-6, 1951 - Continued								
8-6-51								
1:01a								
2:45 <u>1</u> /								
1.50								
Total <u>2</u> /								
5.45								
6.75								
Total								
Rainfall								
R-1								
6.90								
R-2								
nr								
R-4								
6.56								
R-5								
7.40								
R-6								
7.11								
R-7								
7.10								
R-9								
7.33								
Watershed Average								
6.98								
Notes: To convert runoff in in/hr to cfs, multiply by 332.75. <u>1</u> / Estimated from weekly gage. <u>2</u> / Rain exceeded gage capacity.								



PENNIMORE, WISCONSIN      WATERSHED W-1

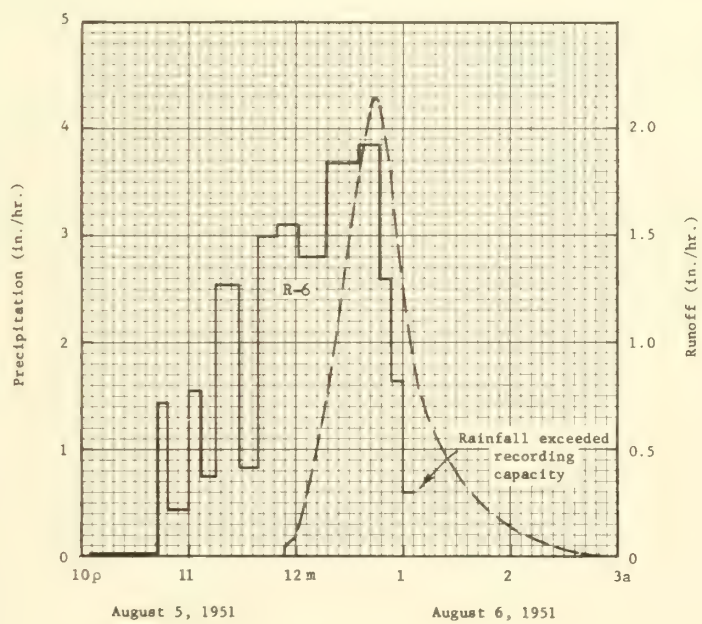




MONTHLY PRECIPITATION AND RUNOFF (Inches)								Fennimore, Wisconsin Watershed W-2 Area - 22.8 acres								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956	P 0.54 Q 0	0.75 e .05	1.85 e 1.02	4.21 0	4.48 0	4.08 .04	3.62 0	5.78 T	1.60 0	1.25 0	3.56 0	0.76 0	32.48 1.11			
1957	P .22 Q .19	.36 e .22	.61 e .02	1.97 0	4.60 0	5.00 .01	7.02 .03	2.98 0	1.28 0	1.58 0	2.53 0	1.25 .01	29.40 .48			
1958	P .30 Q 0	.02 .27	.48 .04	2.82 0	1.68 0	2.76 0	3.56 0	3.51 0	1.64 0	1.96 0	1.18 0	.31 e .01	20.22 .32			
1959	P .66 Q 0	1.49 0	2.85 4.84	2.11 .79	6.24 .06	5.66 .01	2.21 0	6.82 .03	2.89 0	5.45 .01	2.75 .01	1.83 T	40.96 5.75			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Fennimore, Wisconsin Watershed W-2								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	1-24	0.05	1-24	0.05	1-24	0.09	1-24	0.18	1-24	0.19	1-24	0.19	1-24	0.19	2-9	e 0.22
1958	2-23	.05	2-23	.05	2-23	.09	2-23	.18	2-23	.19	2-23	.20	2-23	.27	2-23	.27
1959	5-10	.24	3-19	.08	3-19	.14	3-19	.36	3-19	.71	3-19	1.09	3-24	1.20	3-24	3.77
Notes: Quality of records: P - excellent; Q - excellent, except for periods of melting snow. Watershed conditions: 18% small grain or corn, 82% idle hay and pasture lands.																
SELECTED RUNOFF EVENTS								Fennimore, Wisconsin Watershed W-2								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
6-15-50	0.29	0	7-15-50	Raingage	R-6	7-15-50										
6-17	.09	0	7:10p	0	0	7:44p	0									
6-18	.36	0	:16	4.70	.47	:54	.223									
6-20	.42	0	:33	1.97	1.03	:59	.334									
6-23	.48	0	:40	3.60	1.45	8:01	.334									
7-1	.66	0	:43	6.00	1.75	:10	.214									
7-3	.11	0	:45	2.70	1.84	:20	.0819									
7-12	.60	0	9:03	0	1.84	:30	.0213									
			:13	.06	1.85	:50	.0001									
			:30	.42	1.97	9:35	0									
Watershed Conditions			:43	5.22	3.10	:45	.0548									
18.4% hay; 81.6% pasture			:49	1.00	3.20	:47	.163									
			:57	2.48	3.53	:50	.373									
			10:18	.26	3.62	:52	.556									
			:50	1.56	4.45	:55	1.56									
			11:30	1.13	5.20	:57	1.33									
			:46	.72	5.39	10:01	1.44									
			7-16-50			:10	1.05									
			12:05a	1.83	5.97	:20	.609									
			:13	1.35	6.15	:30	.401									
			Total 1		7.41	:35	.346									
						:45	.332									
						11:00	.452									
						:05	.475									
						:30	.349									
						:45	.283									
						7-16-50										
						12:00a	.184									
						:05	.180									
						:10	.243									
Notes: To convert runoff in in/hr to cfs, multiply by 22.988. 1/ Rain exceeded gage capacity. For map of watershed, see page 31.1-5.																

Cooperative Research Project of USDA and Wisconsin Agricultural Experiment Station

SELECTED RUNOFF EVENTS						Fennimore, Wisconsin Watershed W-2		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 15-16, 1950 - Continued</u>								
						7-16-50		
						12:15a	.461	1.360
						:19	.805	1.403
						:26	.986	1.507
						:40	1.07	1.750
						:45	1.01	1.837
						1:00	.639	2.047
						:20	.259	2.190
						:40	.0774	2.241
						2:10	.0070	2.256
						3:00	0	2.258
<u>Event of August 5-6, 1951</u>								
7-8-51	2.80	.024	8-5-51	Raingage	R-6	8-5-51		
7-10	.04	0	10:05p	0	0	11:53p	0	0
7-13	.19	0	:44	.03	.02	:54	.0470	0
7-16	.39	0	:49	1.44	.14	12:00m	.0901	.007
7-21	.70	0	11:00	.44	.22	8-6-51		
7-27	.04	0	:07	1.55	.40	12:08a	.347	.030
8-5 <u>1</u> /	.55	0	:15	.75	.50	:10	.452	.043
			:28	2.54	1.05	:19	.761	.133
			:39	.82	1.20	:27	1.33	.273
			:50	3.00	1.75	:39	1.95	.606
<u>Watershed Conditions</u>			8-6-51			:43	2.14	.742
100% pasture			12:02a	3.10	2.37	:46	2.13	.848
			:17	2.80	3.07	:53	1.82	1.083
			:35	3.69	4.18	1:00	1.25	1.261
			:47	3.85	4.95	:10	.736	1.419
			:53	2.60	5.21	:30	.396	1.601
			1:00	1.63	5.40	2:05	.105	1.732
			:07	.60	5.47	:50	.0172	1.781
			2:45 <u>2</u> /	Total <u>3</u> /	7.11	3:35	.0005	1.783
						:45	0	1.783
Notes: To convert runoff in in/hr to cfs, multiply by 22.988. <u>1</u> / Prior to event beginning 10:05p. <u>2</u> / Estimated from weekly gage. <u>3</u> / Rain exceeded capacity of gage.								



FENNIMORE, WISCONSIN WATERSHED W-2



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Fennimore, Wisconsin Watershed W-3 Area - 52.5 acres						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1956 P Q	0.49 0	0.73 e .05	1.79 e .90	4.21 0	4.25 0	3.63 0	3.60 0	5.67 T	1.55 0	1.24 0	3.41 0	0.73 0	31.30 .95	
1957 P Q	.16 .18	.28 e .22	.70 .02	1.93 0	4.28 0	4.67 .02	6.72 T	3.02 0	1.31 0	1.67 0	2.35 0	1.13 T	28.22 .44	
1958 P Q	.23 0	.02 .21	.43 e .02	2.72 0	1.71 0	2.56 0	3.50 0	3.31 0	1.79 0	1.94 0	1.23 0	.35 0	19.79 .23	
1959 P Q	.68 0	1.50 0	2.96 2.46	2.01 .04	6.21 0	5.77 0	2.28 0	7.36 0	3.15 0	5.49 0	2.81 0	1.96 0	42.18 2.50	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Fennimore, Wisconsin Watershed W-3								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	1-24	0.06	1-24	0.05	1-24	0.09	1-24	0.17	1-24	0.18	1-24	0.18	1-24	0.18	2-9	e 0.22
1958	2-23	.06	2-23	.06	2-23	.12	2-23	.19	2-23	.19	2-23	.20	2-23	.21	2-23	.21
1959	3-24	.05	3-24	.05	3-24	.10	3-24	.26	3-24	.40	3-24	.51	3-24	.51	3-24	1.89

Notes: Quality of records: P - excellent; Q - excellent, except for periods of melting snow. Watershed conditions: 23% permanent pasture; 7% roads and farmsteads; remainder farmed as 3 or 4-yr. rotation of corn, oats and meadow.

SELECTED RUNOFF EVENTS						Fennimore, Wisconsin Watershed W-3					
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Event of August 12, 1943											
7-14-43	0.22	0	8-12-43	Raingage	R-7	8-12-43					
7-16	1.50	T	4:48a	0	0	5:01a	0	0			
7-24	.18	0	:50	3.00	.10	:06	.1764	.006			
7-28	.13	0	:55	10.20	.95	:08	.9700	.023			
7-29	.06	0	5:00	5.16	1.38	:10	1.1200	.058			
8-2	.17	0	:05	5.40	1.83	:12	1.1250	.096			
8-9	.20	0	:13	2.40	2.15	:14	1.0620	.132			
8-12 1/	1.05	T				:16	.9650	.166			
Watershed Conditions				Raingage	R-8	:20	.7300	.222			
19.3% corn; 7.8% small grain; 29.2% hay; 36.4% pasture; 7.3% roads and buildings.			8-12-43			:24	.5210	.263			
			4:49a	0	0	:28	.3670	.293			
			:55	9.30	.93	:32	.2680	.314			
			5:00	6.36	1.46	:37	.1890	.333			
			:07	4.62	2.00	:45	.1098	.353			
			:13	3.20	2.32	:50	.0810	.360			
						6:00	.0427	.370			
						:20	.0129	.379			
						:40	.0048	.382			
						7:00	.0018	.383			
						:20	.0004	.383			
						:32	0	.383			
Event of July 11, 1944											
6-11-44	0.14	0	7-11-44	Raingage	R-7	7-11-44					
6-12	1.83	.02	6:30p	0	0	6:45p	0	0			
6-13	.37	T	:40	3.60	.60	7:00	.0072	T			
6-15	.76	.01	:45	6.24	1.12	:01	.0208	.001			
6-17	1.51	.35	:50	6.12	1.63	:04	.6640	.015			
6-22	1.58	.29	:58	1.73	1.86	:07	.4750	.043			
6-26	.27	0	7:05	.51	1.92	:10	.3500	.064			
7-10	.02	0	:15	.24	1.96	:14	.2460	.083			
						:18	.1890	.098			

Notes: To convert runoff in in/hr to cfs, multiply by 52.94. 1/ Prior to event beginning 4:48a. For map of watershed, see page 31.1-5.

SELECTED RUNOFF EVENTS						Fennimore, Wisconsin Watershed W-3		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Watershed Conditions</u>			<u>Event of July 11, 1944 - Continued</u>					
37% corn; 1.4% small grain; 23.8% hay; 28.6% pasture; 7.3% roads and buildings.			6:33p	Rainage	R-8	7:24p	0.1272	0.113
			:40	0	0	:30	.0905	.124
			:45	3.69	.43	:36	.0640	.132
			:50	5.40	.88	:48	.0314	.141
				7.68	1.52	8:00	.0140	.145
			:53	3.60	1.70	:20	.0034	.148
			7:01	1.35	1.88	:40	.0010	.148
			:17	.23	1.94	9:00	0	.148
			<u>Event of June 28, 1945</u>					
			6-28-45	Rainage	R-7	6-28-45		
5-31-45	0.50	0	5:43a	0	0	5:50a	0	0
6-1	1.82	.19	:48	8.40	.70	:52	.0454	.001
6-2	.02	0	:52	3.75	.95	:54	.0349	.002
6-9	.19	0	6:00	.75	1.05	:56	.1348	.004
6-10	.49	0						
6-14	.56	0		Rainage	R-8	:58	.2530	.012
6-15	.56	0	5:44a	0	0	:59	.2174	.015
6-17	.06	0	:47	10.00	.50	6:00	.5350	.022
6-24	.91	0	:51	4.95	.83	:01	1.6200	.040
6-26	.05	0	:56	1.44	.95	:02	1.6300	.067
6-27	.21	0	6:02	.50	1.00	:04	1.3700	.117
6-28 1/	1.01	0				:08	.9700	.195
<u>Watershed Conditions</u>						:12	.6250	.248
25.7% corn; 23.7% small grain; 15.5% hay; 27.8% pasture; 7.3% roads and buildings.						:16	.4390	.283
						:18	.3590	.296
						:24	.2246	.325
						:30	.1570	.344
						:36	.1080	.357
						:48	.0550	.373
						7:00	.0291	.382
						:12	.0135	.386
						:24	.0062	.388
						:36	.0026	.389
						:48	.0008	.389
						:54	.0003	.389
						8:00	.0002	.389
						:12	0	.389
			<u>Event of June 24-25, 1949</u>					
5-25-49	0.03	0	6-24-49	Rainage	R-7	6-24-49		
5-27	.06	0	7:45p	0	0	8:25p	0	0
6-1	.27	0	:55	2.40	.40	:26	.0026	0
6-2	.55	0	8:02	4.28	.90	:27	.3875	.003
6-12	.23	0	:10	3.23	1.33	:28	.4710	.010
6-13	.01	0	:26	1.20	1.65	:29	.4785	.018
6-14	1.82	0	9:00	.18	1.75	:30	.4710	.026
6-20	.61	0	10:50	.08	1.90	:36	.3554	.068
6-21	.28	0	6-25-49			:42	.2872	.100
6-22	.05	0	12:30a	.04	1.97	:48	.2324	.126
6-23	1.89	0	6-24-49	Rainage	R-8	:54	.1844	.146
6-24 2/	.20	0	7:43p	0	0	9:00	.1434	.163
<u>Watershed Conditions</u>			:46	1.60	.08	:20	.0616	.196
13.6% corn; 20.2% small grain; 16.4% hay; 42.5% pasture; 7.3% roads and buildings.			:50	3.30	.30	:40	.0196	.209
			:57	4.55	.83	10:00	.0051	.213
			8:07	3.72	1.45	:30	.0004	.214
			:15	.98	1.58	:50	0	.214
			:23	1.50	1.78			
			9:15	.19	1.94			
			10:50	.05	2.02			
			6-25-49					
			1:00a	.03	2.09			

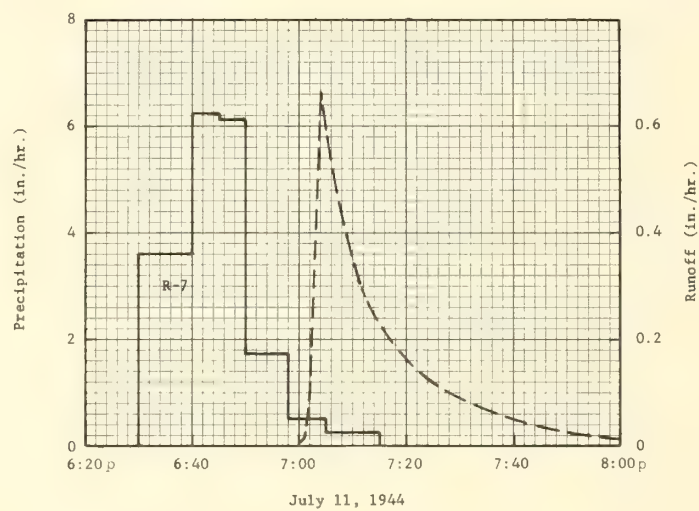
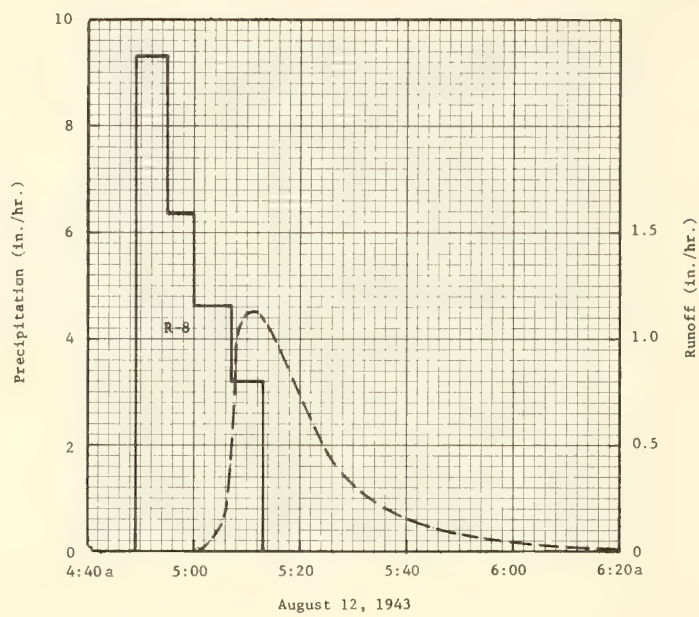
Notes: To convert runoff in in/hr to cfs, multiply by 52.94. 1/ Prior to event beginning 5:43a. 2/ Prior to event beginning 7:45p, 6-24.

SELECTED RUNOFF EVENTS						Fennimore, Wisconsin Watershed W-3		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 15-16, 1950								
6-15-50	0.29	0	7-15-50	Rainage	R-7	7-15-50		
6-17	.05	0	7:07p	0	0	7:35p	0	0
6-18	.33	0	:11	3.90	.26	:49	.0397	.003
6-20	.39	0	:16	2.76	.49	:50	.199	.005
6-23	.47	0	:29	1.90	.90	:53	.478	.025
7-1	.74	0	:40	4.09	1.65	8:00	.322	.072
7-3	.10	0	:45	.72	1.71	:15	.151	.128
7-12	.58	0	9:10	0	1.71	:40	.042	.164
			:19	.60	1.80	9:32	.0023	.177
			:27	.15	1.82	:40	.0713	.179
<u>Watershed Conditions</u> 21% corn; 8% small grain; 13.7% hay; 50% pasture; 7.3% roads and build- ings.			:31	1.95	1.95	:44	.403	.193
			:38	6.86	2.75	:45	.694	.202
			:42	4.20	3.03	:47	1.30	.238
			:47	.36	3.06	:50	1.24	.301
			:54	2.83	3.39	10:00	1.19	.503
			:59	.24	3.41	:08	.849	.641
			10:03	1.05	3.48	:17	.448	.735
			:14	.11	3.50	:30	.272	.807
			11:00	1.37	4.55	:45	.403	.890
			:30	1.04	5.07	11:00	.509	1.008
			:53	.55	5.28	:10	.433	1.088
			7-16-50			:20	.387	1.153
			12:05a	3.05	5.89	:30	.418	1.222
				Total 1/	7.54	:45	.278	1.308
						:57	.188	1.352
Event of July 15-16, 1950 (continued)								
			7-15-50	Rainage	R-8	7-16-50		
			7:07p	0	0	12:03a	.509	1.380
			:11	4.50	.30	:07	.940	1.431
			:16	2.76	.53	:11	1.01	1.497
			:29	1.94	.95	:15	.930	1.561
			:40	4.36	1.75			
			:45	1.20	1.85	:25	1.02	1.723
			9:10	0	1.85	:35	1.04	1.896
			:19	.33	1.90	:50	.675	2.109
			:27	.08	1.91	1:05	.344	2.234
			:31	1.35	2.00	:25	.151	2.315
			:38	6.86	2.80	1:55	.0416	2.357
			:42	4.35	3.09	2:35	.0098	2.372
			:47	.48	3.13	4:30	0	2.379
			:54	2.48	3.42			
			:59	.36	3.45			
			10:03	.75	3.50			
			:14	.05	3.51			
			11:00	1.31	4.52			
			:30	1.10	5.07			
			:53	.39	5.22			
			7-16-50					
			12:05a	3.65	5.95			
				Total 1/	7.46			
Event of August 5-6, 1951								
7-8-51	2.78	.04	8-5-51	Rainage	R-7	8-5-51		
7-10	.05	0	10:45p	0	0	11:55p	0	0
7-13	.15	0	11:05	.75	.25	12:00m	.0260	.001
7-16	.34	0	:10	1.80	.40	8-6-51		
7-21	.73	0	:19	.67	.50	12:10a	.310	.024
7-27	.03	0	:31	2.50	1.00	:20	.471	.088
8-5 2/	.55	0	:42	.82	1.15	:31	.803	.202
			:51	3.33	1.65	:45	1.29	.449
<u>Watershed Conditions</u> 3.4% corn; 26.6% small grain; 15.8% hay; 46.9% pasture; and 7.3% roads and buildings.			8-6-51			:51	1.40	.585
			12:04a	3.23	2.35	:55	1.37	.678
Notes: To convert runoff in in/hr to cfs, multiply by 52.94. 1/ Rainfall exceeded recording capacity of gage. 2/ Prior to event beginning 10:45p.								

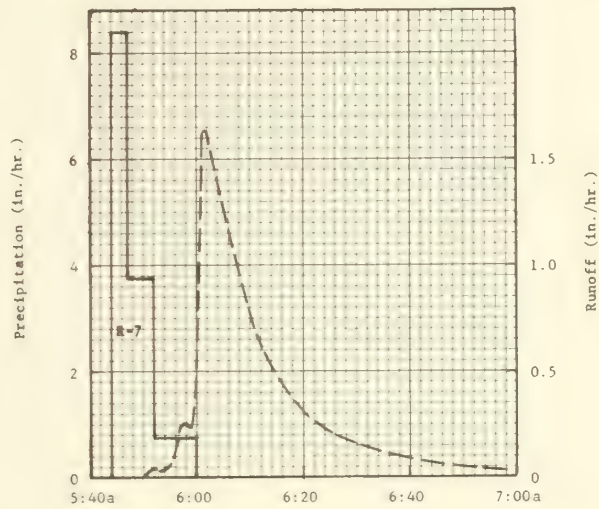
SELECTED RUNOFF EVENTS			Fennimore, Wisconsin Watershed W-3					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 2-6, 1941 - Continued</u>								
			8-6-51			8-6-51		
			12:25a	2.71	3.30	1:06a	1.04	0.902
			:44	3.64	4.45	:15	.747	1.037
			:55	2.73	4.95	:31	.387	1.179
			1:02	1.71	5.15	:55	.204	1.291
			:09	.86	5.25	2:12	.140	1.337
			:15	2.00	5.45	:30	.125	1.380
			2:45 <u>1/</u>	Total <u>2/</u>	7.10	3:00	.0452	1.422
						:30	.0121	1.435
						5:00	.0001	1.439
			8-5-51	Raingage	R-8	6:00	0	1.439
			10:44p	0	0			
			:49	1.44	.12			
			11:01	3.00	.22			
			:07	1.70	.39			
			:15	.68	.48			
			:28	2.63	1.05			
			:40	.75	1.20			
			:49	3.66	1.75			
			8-6-51					
			12:02a	3.23	2.45			
			:23	3.15	3.55			
			:40	3.53	4.55			
			:53	3.23	5.25			
			1:01	1.50	5.45			
			2:45 <u>1/</u>	Total <u>2/</u>	6.75			

Notes: To convert runoff in in/hr to cfs, multiply by 52.94. 1/ Estimated from weekly gage. 2/ Rain exceeded recording capacity of gage.

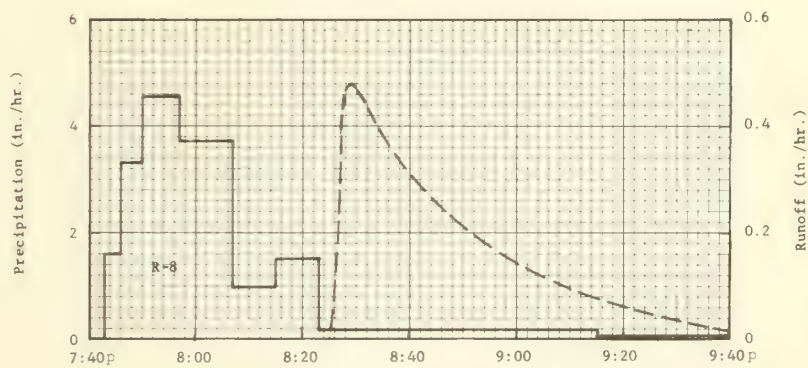




FENNIMORE, WISCONSIN WATERSHED W-3

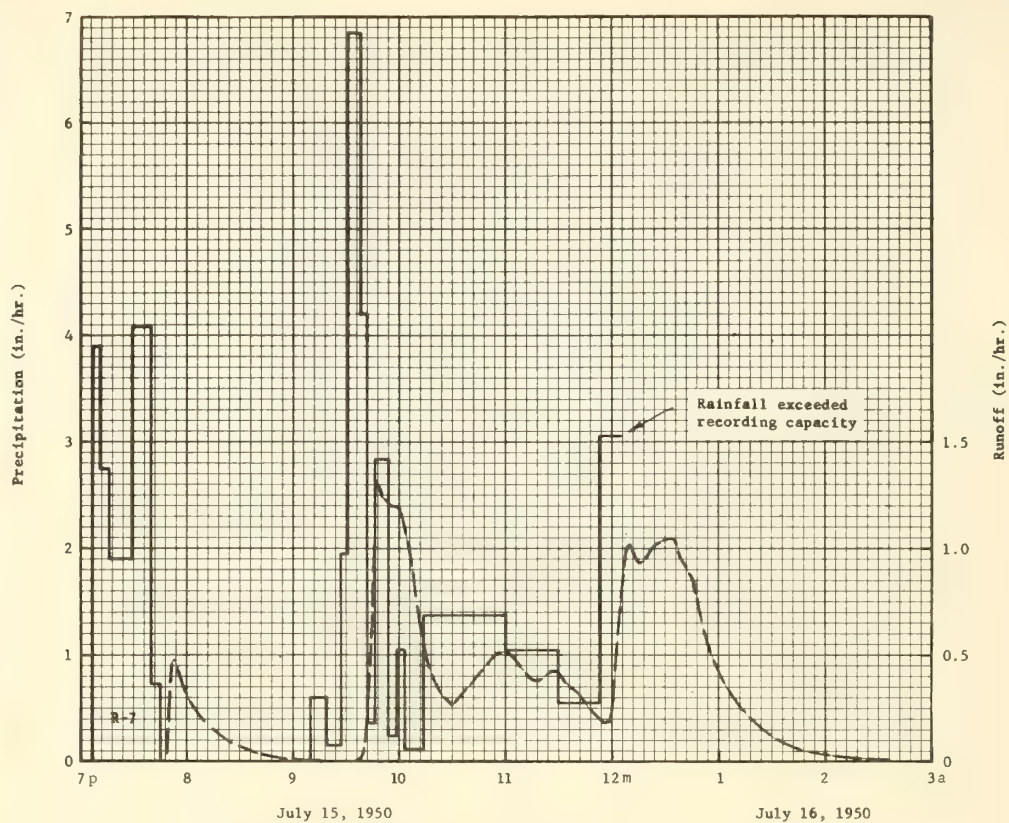


June 28, 1945



June 24, 1949

FENNIMORE, WISCONSIN WATERSHED W-3



4-61

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Fennimore, Wisconsin Watershed W-4 Area - 171 acres						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1956 P Q	0.69 0	0.76 .07	1.95 1.17	4.06 0	4.56 0	3.76 .14	3.65 0	5.71 .01	1.58 0	1.27 0	3.38 T	0.74 0	32.11 1.39	
1957 P Q	.23 .26	.35 e .32	.71 .03	1.96 0	4.56 0	4.54 .03	6.76 .02	2.98 0	1.35 0	1.58 0	2.37 0	1.17 .04	28.56 .70	
1958 P Q	.33 0	.02 .37	.53 .02	2.73 0	1.56 0	2.63 0	3.47 0	3.64 0	1.98 0	1.92 0	1.39 0	.40 0	20.60 .39	
1959 P Q	.75 0	1.62 0	2.87 3.36	2.01 .26	6.27 .10	5.95 .03	2.25 0	7.66 .06	3.13 0	5.31 0	2.55 .01	2.19 .01	42.56 3.83	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Fennimore, Wisconsin Watershed W-4								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	1-24	0.09	1-24	0.08	1-24	0.14	1-24	0.23	1-24	0.26	1-24	0.26	1-24	0.26	2-9	e 0.27
1958	2-23	.10	2-23	e .09	2-23	e .13	2-23	e .24	2-23	e .25	2-23	e .29	2-23	e .37	2-23	e .37
1959	5-10	.16	3-31	.07	3-31	.13	3-31	.28	3-24	.33	3-30	.59	3-24	1.01	3-24	2.81

Notes: Quality of records: P - excellent; Q - excellent, except for periods of melting snow. Watershed conditions: 13% permanent pasture; 6% roads and farmsteads; remainder 3-yr. rotation of corn, oats and hay.

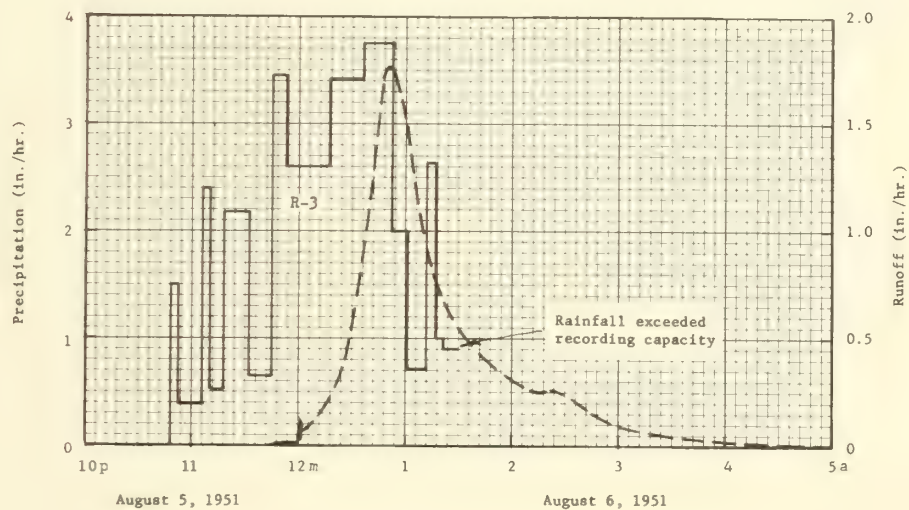
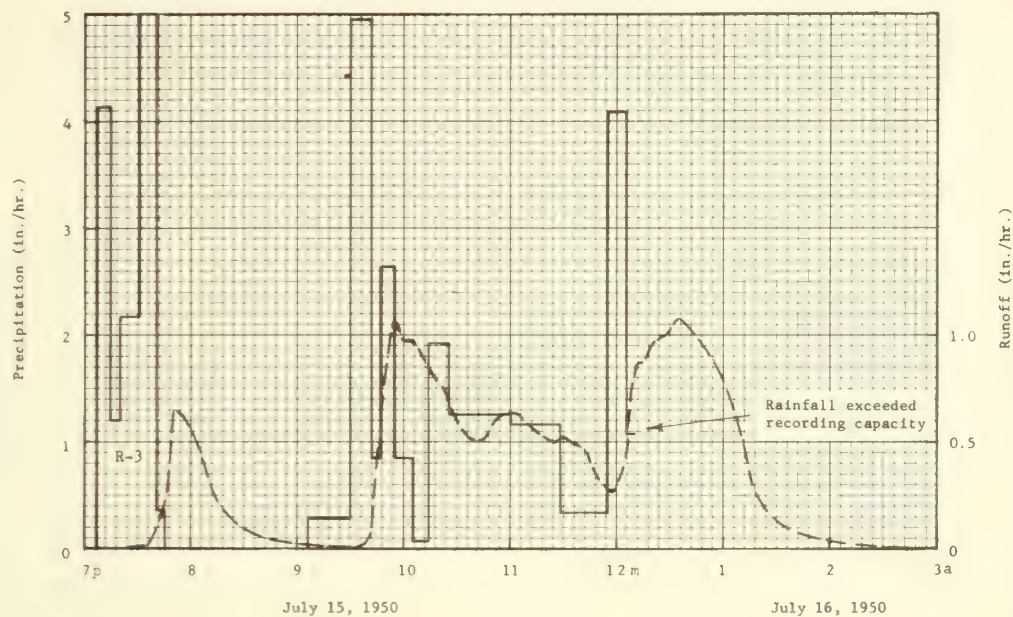
SELECTED RUNOFF EVENTS						Fennimore, Wisconsin Watershed W-4					
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Event of July 10-15, 1959											
6-15-50	0.28	0	7-15-50	Raingage	R-3	7-15-50					
6-17	.07	0	7:07p	0	0	7:15p	0	0			
6-18	.33	0	:15	4.13	.55	:38	.0486	.0027			
6-20	.30	0	:20	1.20	.65	:42	.129	.0093			
6-23	.48	0	:31	2.18	1.05	:45	.144	.0161			
7-1	.52	0	:40	5.00	1.80	:48	.414	.0287			
7-3	.12	0	:45	.36	1.83	:51	.652	.0570			
7-12	.60	0	9:06	0	1.83	8:00	.567	.1494			
Watershed Conditions			:30	.28	1.94	:11	.305	.2310			
			:42	4.95	2.93	:20	.161	.2640			
20% corn; 25.4% grain; 36.6% hay; 12.3% pasture; 5.7% roads and buildings.			:47	.84	3.00	:55	.0274	.3064			
			:55	2.63	3.35	9:30	.0070	.3148			
			10:05	.84	3.49	:39	.0432	.3171			
			14	.07	3.50	:45	.380	.3330			
			:25	1.91	3.84	:50	.840	.3831			
			11:00	1.25	4.58	:54	1.06	.4465			
			:28	1.16	5.12	10:00	.975	.5482			
			:55	.33	5.27	:05	.980	.6301			
			7-16-50			:15	.828	.7812			
			12:05a	4.08	5.95	:25	.700	.9097			
			:10	1.08	6.04	:35	.538	1.0105			
			Total 1		7.24	:45	.506	1.0968			
						:55	.627	1.1927			
			7-15-50	Raingage	R-4	11:00	.638	1.2454			
						:15	.547	1.3950			
			7:05p	0	0	:26	.500	1.4901			
			:11	3.50	.35	:30	.525	1.5243			
			:27	2.06	.90	:45	.417	1.6443			
			:39	3.80	1.66	:59	.283	1.7192			
			:43	.60	1.70	7-16-50					

Notes: To convert runoff in in/hr to cfs, multiply by 172.425. 1/ Rain gauge located at 100 ft. from road.  
For full watershed, multiply by 1.71.

Cooperative Research Project of USDA and Wisconsin Agricultural Experiment Station



SELECTED RUNOFF EVENTS						Fennimore, Wisconsin Watershed W-4		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 15-16, 1950 - Continued</u>								
			9:10p	0.01	1.72	7-16-50		
			:28	.36	1.83	12:05a	0.434	1.7534
			:42	4.58	2.90	:10	.829	1.8052
			:46	1.20	2.98	:20	.955	1.9529
			:56	2.16	3.34	:35	1.07	2.2048
			10:13	.35	3.44	:55	.876	2.5340
			:24	2.23	3.85	1:11	.505	2.7250
			:55	1.37	4.56	:25	.179	2.7939
			11:04	.40	4.62	2:00	.0350	2.8438
			:36	.92	5.11	3:00	.0038	2.8587
			:54	.63	5.30	5:00	0	2.8618
			7-16-50					
			12:07a	3.46	6.05			
				Total 1/	7.54			
				Total	Rainfall			
				R-1	7.25			
				R-2	7.20			
				Watershed Average	7.31			
			<u>Event of August 5-6, 1951</u>					
7-8-51	2.89	.192	8-5-51	Raingage	R-3	8-5-51		
7-10	.04	0	10:48p	0	0	11:15p	0	0
7-13	.16	0	:52	1.50	.10	:48	.010	.0023
7-16	.36	0	11:06	.39	.19	12:00m	.021	.0047
7-21	.72	0	:10	2.40	.35	8-6-51		
7-27	.04	0	:18	.53	.42	12:01a	.115	.0058
8-5 2/	.55	0	:32	2.18	.93	:03	.0733	.0088
			:45	.64	1.07	:15	.192	.0332
			:53	3.45	1.53	:23	.316	.0666
			8-6-51			:30	.565	.1171
			12:17a	2.60	2.57	:37	.909	.2018
			:36	3.41	3.65	:42	1.29	.2946
			:52	3.75	4.65	:45	1.52	.3644
			1:01	2.00	4.95	:51	1.76	.5341
			:12	.71	5.08	:54	1.74	.6217
			:17	2.64	5.30	1:00	1.53	.7860
			:20	1.00	5.35	:05	1.22	.9003
			:30	.90	5.50	:10	1.01	.9923
			2:45 3/	Total 1/	6.73	:20	.685	1.1312
						:35	.491	1.2765
			8-5-51	Raingage	R-4	:55	.349	1.4146
			10:42p	0	0	2:12	.260	1.4986
			11:00	.84	.25	:34	.220	1.5892
			:05	1.92	.41	:52	.123	1.6400
			:14	.60	.50	3:10	.0777	1.6699
			:27	2.31	1.00	:30	.0469	1.6906
			:38	.77	1.14	4:00	.0205	1.7071
			:58	2.88	2.10	:30	.0114	1.7147
			8-6-51			8:00	.0004	1.7246
			12:23a	3.24	3.45	12:00n	0	1.7257
			:41	3.83	4.60			
			:53	3.00	5.20			
			1:06	.92	5.40			
			:10	1.95	5.53			
			2:45 3/	Total 1/	6.56			
				Total	Rainfall			
				R-1	6.90			
				R-2	nr			
				Watershed Average	6.73			
<p>Watershed Conditions</p> <p>29% corn; 12.7% grain; 21.8% hay; 30.8% pasture; 5.7% roads and build- ings.</p>								
<p>Notes: To convert runoff in in/hr to cfs, multiply by 172.425. 1/ Rain exceeded recording capacity of gage. 2/ Prior to event beginning 10:48p. 3/ Estimated from weekly gage.</p>								



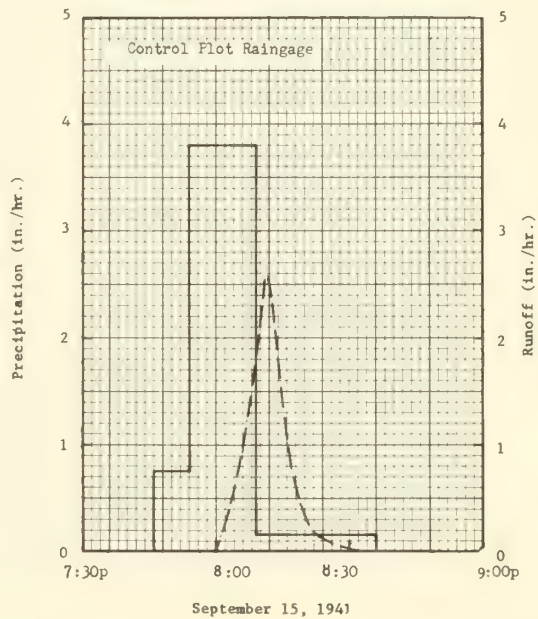
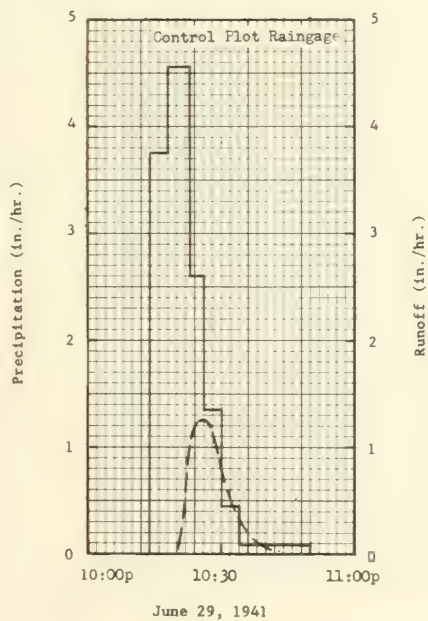
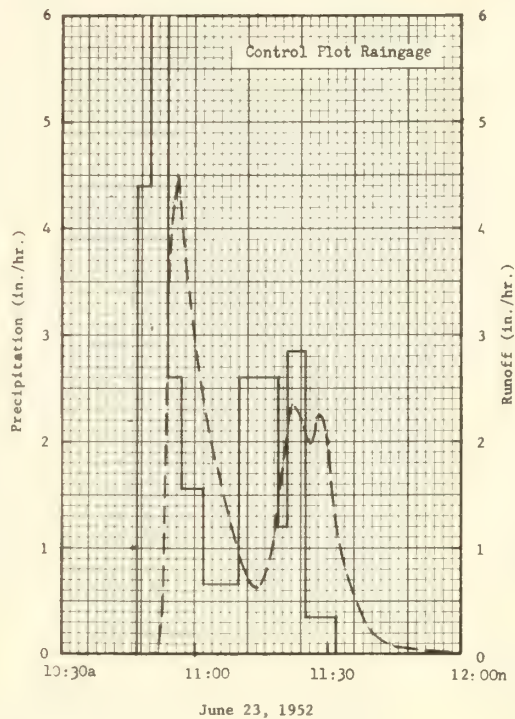
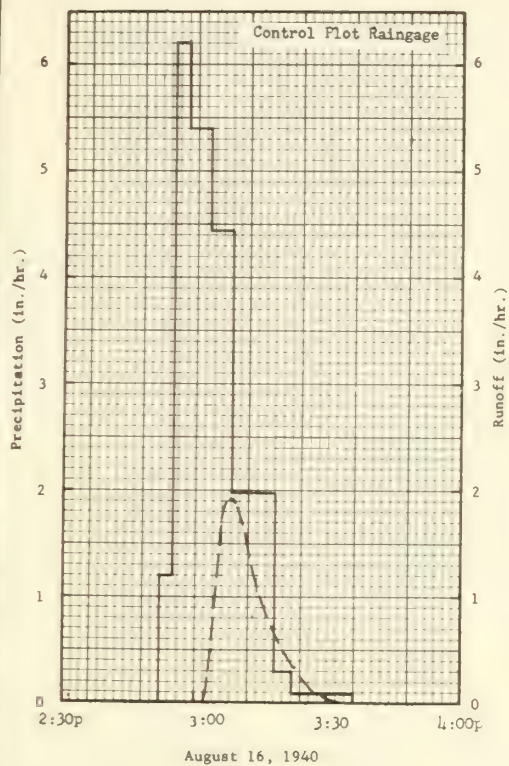
PENNIMORE, WISCONSIN    WATERSHED W-4

MONTHLY PRECIPITATION AND RUNOFF (Inches)										La Crosse, Wisconsin Watershed CW (Area - 2.71 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P	0.44	0.36	3.06	2.09	3.42	2.52	3.19	3.36	1.78	1.68	2.08	0.59	24.57			
Q	0	0	e .88	e .75	0	0	0	0	0	0	0	0	1.63			
1957 P	.35	.27	.95	2.41	4.29	5.02	6.97	4.46	2.29	1.02	2.98	.68	31.69			
Q	0	0	0	0	0	.06	.40	.01	0	0	0	0	.47			
1958 P	.36	.05	.32	2.11	1.11	2.02	3.13	1.49	3.70	1.07	2.38	.30	18.04			
Q	0	0	0	0	0	0	0	0	0	0	0	0	0			
1959 P	.82	2.30	2.66	.72	6.96	3.63	2.53	11.56	6.81	2.76	2.68	1.33	44.76			
Q	0	0	2.26	.96	.02	0	0	.96	.23	0	T	0	4.43			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							La Crosse, Wisconsin Watershed CW									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1959	8-26	2.78	8-26	0.77	8-26	0.83	8-26	0.83	8-26	0.83	8-26	0.83	3-31	0.96	3-28	2.24
Notes: Quality of records: P - good; Q - Jan., Feb., Mar., poor — Apr. to Dec., good. Watershed conditions: 1956 - hay; 1957 and 1958 - hay and corn; 1959 - hay.																
SELECTED RUNOFF EVENTS							La Crosse, Wisconsin Watershed CW									
Antecedent conditions			Rainfall						Runoff							
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of August 16, 1940																
7-26-40	0.12	0	8-16-40	Control Plot Rainage		8-16-40										
7-28	.10	0	2:52p	0	0	2:58p	0	0								
7-29	.26	0	:55	1.20	.06	3:02	.0004	T								
7-31	.02	0	:58	6.20	.37	:04	.693	.010								
8-1	1.30	.01	3:03	5.40	.82	:06	1.71	.055								
8-3	.17	0	:08	4.44	1.19	:08	1.92	.117								
8-5	.06	0	:18	1.98	1.52	:11	1.65	.208								
8-10	.33	0	:22	.30	1.54	:14	1.06	.275								
8-11	.30	0	:36	.09	1.56	:19	.600	.342								
8-12	.52	0				:23	.341	.374								
8-14	.55	0				:27	.108	.387								
8-15	.19	0				:32	.0180	.391								
						4:15	0	.393								
Watershed Conditions																
100% hay																
Event of June 29, 1941																
5-30-41	.29	T	6-29-41	Control Plot Rainage		6-29-41										
6-6	.03	0	10:14p	0	0	10:20p	0	0								
6-7	.34	0	:18	3.75	.25	:22	.583	.007								
6-9	.60	0	:23	4.56	.63	:23	1.01	.020								
6-11	.97	0	:26	2.60	.76	:25	1.25	.057								
6-12	.87	.02	:30	1.35	.85	:27	1.22	.099								
6-13	.47	0	:34	.45	.88	:29	.984	.137								
6-14	.22	0	:50	.08	.90	:33	.423	.182								
6-26	.70	0				:37	.136	.200								
6-27	.06	0				:43	.0240	.207								
Watershed Conditions																
100% hay																
						11:20	.0004	.210								
Notes: To convert runoff in in/hr to cfs, multiply by 2.732.																

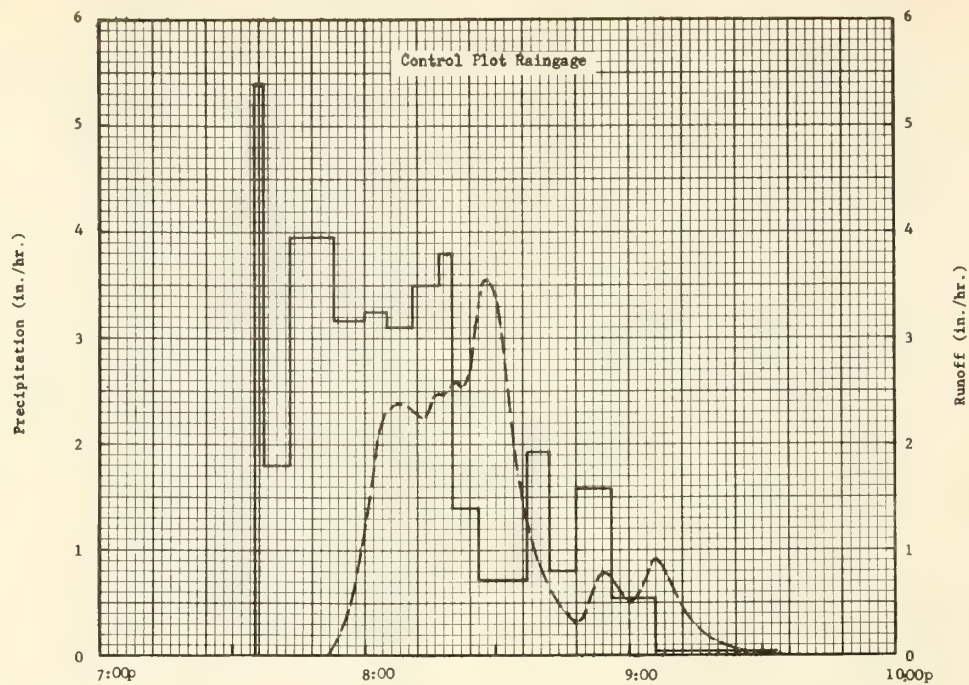
SELECTED RUNOFF EVENTS						La Crosse, Wisconsin Watershed CW		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of September 15, 1941</u>								
8-20-41	.04	0	9-15-41	Control Plot Raingage		9-15-41		
8-21	.03	0	7:46p	0	0	8:00p	0	0
8-25	.10	0	:54	.75	.10	:02	.269	.005
8-31	.08	0	8:09	3.80	1.05	:05	.732	.028
9-3	.70	.01	:30	.16	1.12	:08	1.46	.082
9-4	.17	0				:10	2.14	.140
9-7	1.80	.14				:11	2.58	.179
9-8	1.40	.04				:13	2.14	.260
9-9	.26	0				:15	1.39	.320
9-11	.02	0				:17	.772	.354
9-13	.15	0				:21	.247	.386
9-14	.40	0				:28	.0422	.400
9-15 1/	.36	0				:35	.0106	.402
						:55 2/	.0004	.403
<u>Watershed Conditions</u>								
100% hay								
<u>Event of June 23, 1952</u>								
5-24-52	0.15	0	6-23-52	Control Plot Raingage		6-23-52		
5-27	.49	0	10:47a	0	0	10:50a	.0040	0
5-30	.60	0	:50	4.40	.22	:52	.0610	T
5-31	.23	0	:54	6.00	.62	:53	.582	.01
6-1	.14	0	:57	2.60	.75	:54	3.08	.04
6-4	.09	0	11:02	1.56	.87	:55	4.25	.10
6-11	.30	0	:10	.67	.96	:56	4.50	.17
6-13	.29	0	:19	2.60	1.35	:58	3.57	.31
6-14	.04	0	:21	1.20	1.39	11:00	2.96	.42
6-16	.03	0	:25	2.85	1.58	:02	2.35	.50
6-20 2/	.44	0	:32	.34	1.62	:06	1.64	.64
6-23	2.34	0.19				:10	.905	.72
						:14	.618	.77
						:16	.732	.79
						:18	1.11	.82
						:20	1.84	.87
						:22	2.35	.94
						:24	2.20	1.02
						:26	1.99	1.08
						:28	2.24	1.16
						:30	2.02	1.25
						:33	.952	1.30
						:36	.580	1.33
						:39	.268	1.36
						:45	.0940	1.37
						:51	.0380	1.38
						12:00n	.0130	1.38
						:30p	0	1.38
<u>Event of July 19, 1952</u>								
6-20-52	0.44	0	7-19-52	Control Plot Raingage		7-19-52		
6-23	4.10	1.57	7:35p	0	0	7:48p	0	0
6-24	.53	.06	:37	5.40	.18	:52	.0240	T
6-25	.18	0	:43	1.80	.36	:54	.169	T
6-27	.48	0	:53	3.96	1.02	:57	.500	.02
<u>Notes:</u> To convert runoff in in/hr to cfs, multiply by 2.732. 1/ Prior to event beginning 7:46p. 2/ Runoff continued at rate less than 0.01 in/hr until next event 9:27p, 9-15. 3/ Prior to event beginning 10:47a.								



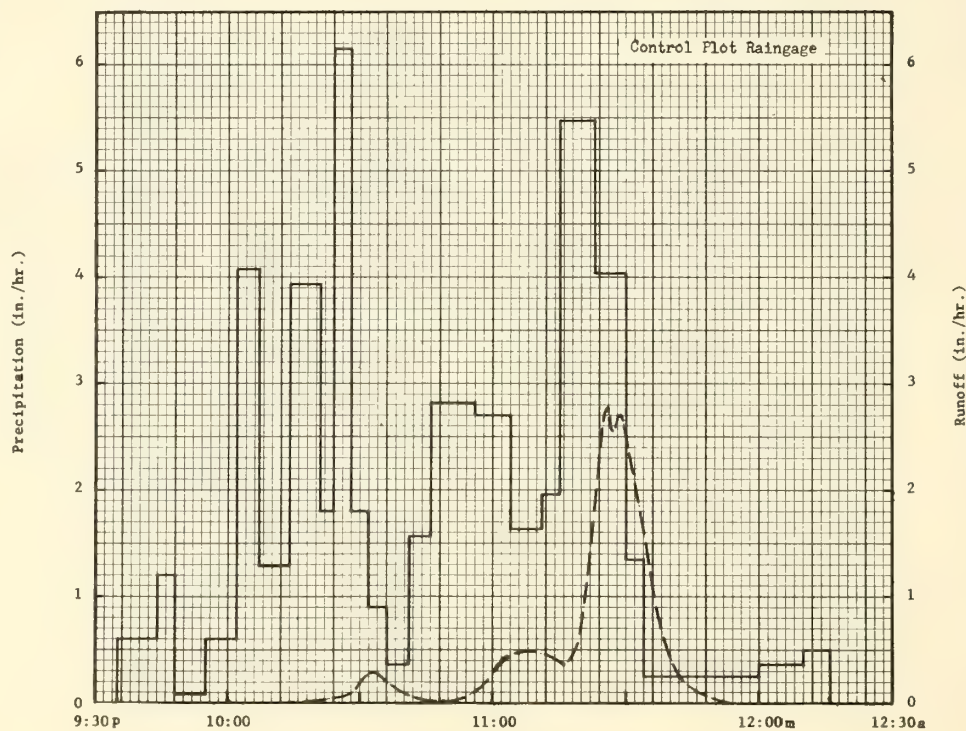
SELECTED RUNOFF EVENTS						La Crosse, Wisconsin Watershed CW		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 19, 1952 - Continued								
7-2-52	.08	0	8:00p	3.17	1.39	8:00p	1.25	.06
7-3	.55	0	:05	3.24	1.66	:02	1.78	.11
7-7	.96	.01	:11	3.10	1.97	:04	2.26	.18
7-13	.40	0	:17	3.50	2.32	:06	2.34	.26
7-14	.65	0	:20	3.80	2.51	:08	2.38	.34
7-18	.08	0	:26	1.40	2.65	:11	2.34	.45
7-19 <u>1/</u>	.67	.01	:37	.71	2.78	:14	2.26	.57
			:42	1.92	2.94	:16	2.46	.65
			:48	.80	3.02	:18	2.46	.73
			:56	1.58	3.23	:21	2.58	.85
Watershed Conditions								
Six contour strips each 45 feet wide.			9:06	.54	3.32	:22	2.54	.90
Alternate strips in hay and corn.			:33	.04	3.34	:24	2.70	.99
Lowest strip in hay.						:26	3.33	1.09
						:28	3.55	1.20
						:30	3.42	1.32
						:33	2.38	1.46
						:36	1.46	1.56
						:39	.907	1.62
						:43	.532	1.66
						:48	.304	1.70
						:51	.516	1.72
						:54	.794	1.75
						:56	.732	1.78
						:58	.600	1.80
						9:00	.516	1.82
						:03	.655	1.85
						:06	.907	1.89
						:09	.732	1.93
						:13	.394	1.96
						:18	.187	1.99
						:24	.0605	2.00
						:34	.0106	2.00
						11:15	0	2.01
Event of August 26, 1959								
7-28-59	.06	0	8-26-59	Control Plot Raingage		8-26-59		
7-30	.35	0	9:35p	0	0	10:10p	0	0
8-2	.19	0	:44	.60	.09	:21	.0240	.001
8-3	2.52	.12	:48	1.20	.17	:28	.0944	.007
8-6	1.10	T	:55	.09	.18	:32	.280	.019
8-10	.08	0	:59	.60	.22	:35	.247	.033
8-11	.12	0	10:02	.60	.25	:41	.0709	.047
8-14	.13	0	:07	4.08	.59	:49	.0153	.052
8-15	.45	0	:14	1.29	.74	:55	.0884	.056
8-16	.89	T	:21	3.94	1.20	11:01	.316	.074
8-21	.54	0	:24	1.80	1.29	:06	.483	.109
8-22	.20	0	:28	6.15	1.70	:11	.468	.149
8-26 <u>2/</u>	.03	0	:32	1.80	1.82	:16	.367	.184
			:36	.90	1.88	:19	.532	.206
			:41	.36	1.91	:22	1.49	.250
Watershed Conditions								
100% hay			:46	1.56	2.04	:24	2.30	.309
			:56	2.82	2.51	:26	2.78	.393
			11:04	2.70	2.87	:27	2.54	.436
			:11	1.63	3.06	:29	2.70	.525
			:15	1.95	3.19	:33	1.85	.678
			:23	5.48	3.92	:36	1.11	.750
			:30	4.03	4.39	:40	.438	.796
			:34	1.35	4.48	:46	.101	.820
			12:00m	.25	4.59	:52	.0240	.826
			8-27-59			8-27-59		
			12:10a	.36	4.65	12:25a	0	.828
			:16	.50	4.70			
Notes: To convert runoff in in/hr to cfs, multiply by 2.732. <u>1/</u> Prior to event beginning 7:35p. <u>2/</u> Prior to event beginning 9:35p, 8-26.								



LA CROSSE, WISCONSIN WATERSHED CW



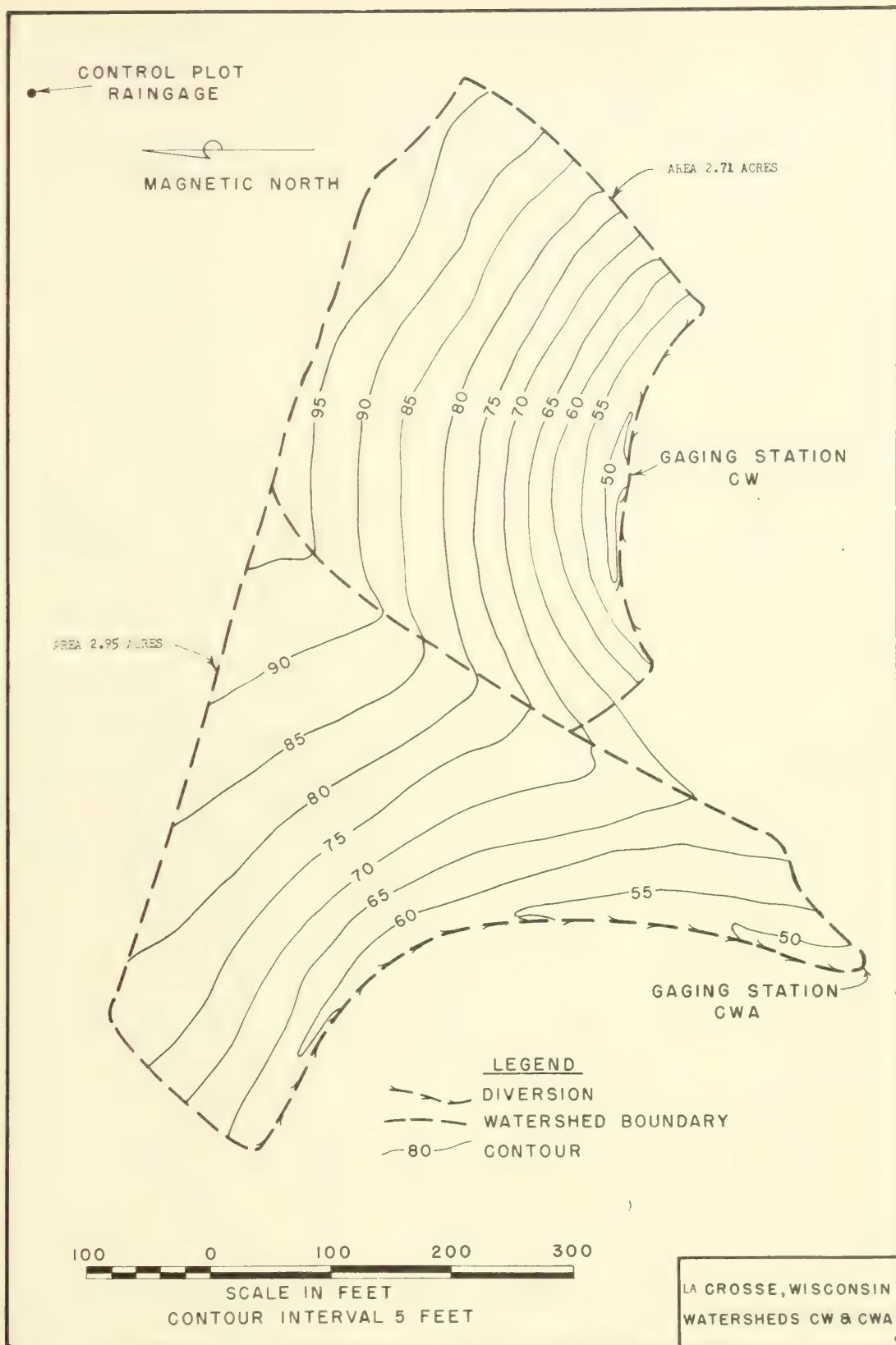
July 19, 1952



August 26-27, 1959

LA CROSSE, WISCONSIN WATERSHED CW







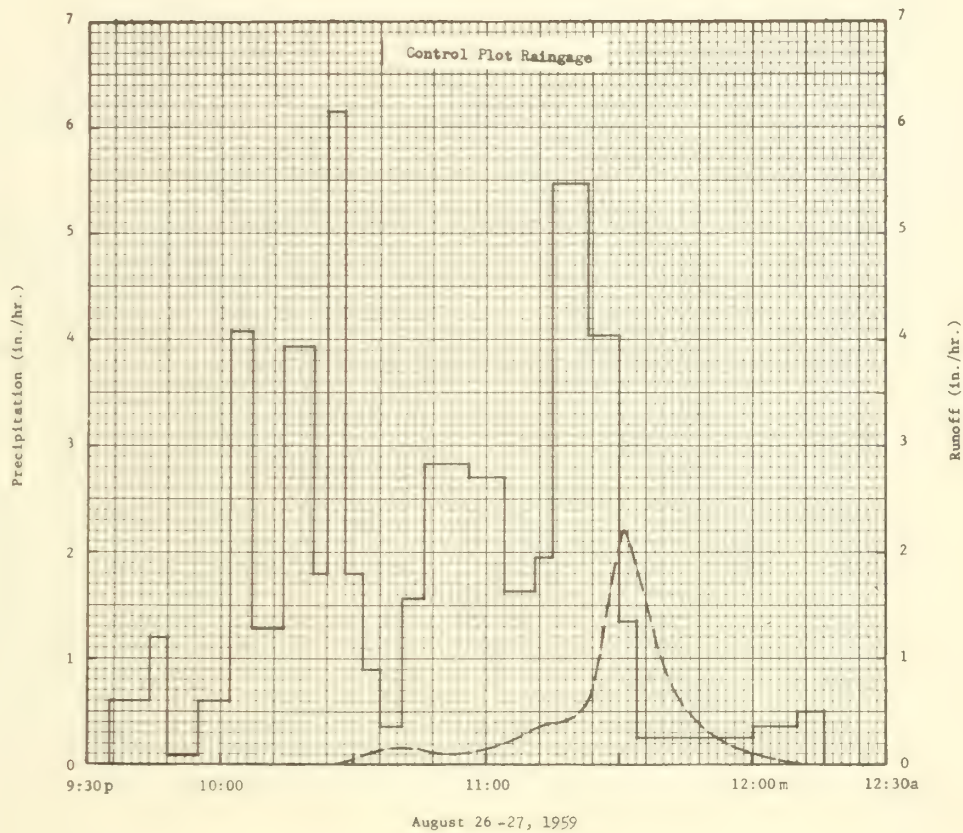
MONTHLY PRECIPITATION AND RUNOFF (Inches)								La Crosse, Wisconsin Watershed CWA (Area - 2.95 acres) 1/								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1952 1/ P	1.68	0.61	2.24	1.03	3.33	6.62	9.23	5.06	0.93	T	2.33	1.12	34.18			
Q	.10	0	.67	0	0	1.44	2.38	.44	0	0	.01	0	5.04			
1953 P	.96	2.06	1.56	4.91	2.15	4.39	11.15	2.07	.48	.44	1.53	1.24	32.94			
Q	0	0	.16	0	.03	.01	1.27	.18	0	0	0	0	1.65			
1954 P	.58	.42	1.17	8.06	1.80	7.24	3.55	2.60	4.59	4.77	1.09	.49	36.36			
Q	0	0	.16	1.00	0	.69	.44	.03	.01	.16	0	0	2.49			
1955 P	.38	.52	1.14	2.90	4.19	2.99	4.14	.71	1.67	1.91	.88	.67	22.10			
Q	0	0	.24	0	0	.04	.42	0	0	0	0	0	.70			
1956 P	0.44	0.36	3.06	2.09	3.42	2.52	3.19	3.36	1.78	1.68	2.08	0.59	24.57			
Q	0	0	.70	1.52	0	0	0	.01	0	0	0	0	2.23			
1957 P	.35	.27	.95	2.41	4.29	5.02	6.97	4.46	2.29	1.02	2.98	.68	31.69			
Q	0	0	0	0	0	.05	.51	.02	0	0	0	0	.58			
1958 P	.36	.05	.32	2.11	1.11	2.02	3.13	1.49	3.70	1.07	2.38	.30	18.04			
Q	0	0	0	0	0	0	0	0	0	0	0	0	0			
1959 P	.82	2.30	2.66	.72	6.96	3.63	2.53	11.56	6.81	2.76	2.68	1.33	44.76			
Q	0	0	.97	1.08	.01	0	0	.95	.26	0	.01	0	3.28			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								La Crosse, Wisconsin Watershed CWA								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1952 1/	7-19	3.53	7-19	1.78	7-19	2.06	7-19	2.14	7-19	2.22	7-19	2.24	7-19	2.24	7-19	2.24
1953	7-4	1.70	7-4	.69	7-4	.74	7-4	.74	7-4	.74	7-4	.74	7-4	.74	7-4	.84
1954	4-30	1.70	4-30	.76	4-30	.93	4-30	.97	4-30	1.04	4-30	1.04	4-30	1.04	4-30	1.04
1955	7-8	.78	7-8	.32	7-8	.38	7-8	.42	7-8	.42	7-8	.42	7-8	.42	7-8	.42
1956	4-2	.08	4-2	.08	4-2	.16	4-2	.39	4-2	.64	4-1	1.17	4-1	1.52	3-26	e1.95
1957	7-21	.73	7-21	.29	7-21	.29	7-21	.29	7-21	.29	7-21	.29	7-21	.29	7-16	.37
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	8-26	2.30	8-26	0.72	8-26	.80	8-26	.80	8-26	.80	3-31	.97	3-31	1.56	3-31	2.04
Notes: Quality of records: P - good; Q - good. Months of Jan., Feb., Mar. and Dec. include snow and snow melt. Watershed conditions: 1956 - hay; 1957 and 1958 - hay and corn; 1959 - hay. 1/ The drainage area has been reduced from 3.06 acres to 2.95 acres, and the monthly runoff and annual maximum values have been revised for the period 1952 through 1958 and supersede those previously reported.																
SELECTED RUNOFF EVENTS								La Crosse, Wisconsin Watershed CWA								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)						
Event of June 23, 1952																
5-24-52	0.15	0		6-23-52	Control Plot Rainage			6-23-52								
5-27	.49	0		10:47a	0	0		10:48a	.0008	0						
5-30	.60	0		:50	4.40	.22		:50	.003	T						
5-31	.23	0		:54	6.30	.64		:53	.164	T						
6-2	.14	0		:57	2.60	.77		:56	.770	.02						
6-4	.09	0		11:02	1.44	.89		:57	2.12	.04						
6-11	.30	0		:10	.68	.98		:58	3.39	.09						
6-13	.29	0		:19	2.67	1.38		11:00	2.94	.20						
6-14	.04	0		:21	1.20	1.42		:02	2.38	.28						
6-16	.03	0		:25	3.00	1.62		:06	1.64	.42						
6-20	.44	0		:32	.34	1.66		:12	.857	.54						
6-23 1/	2.34	.2192						:16	.654	.59						
Watershed Conditions																
Six strips on 2% grade. Lowest strip in hay, then alternate strips in corn and hay.																
								:18	.691	.61						
								:20	.928	.64						
								:22	1.61	.67						
								:24	2.04	.74						
								:27	1.90	.84						
								:30	1.84	.93						
								:32	1.55	.97						
								:36	.857	1.07						
								:42	.362	1.12						
								:51	.106	1.16						
								12:07p	.014	1.17						
								1:17	0	1.17						
Notes: To convert runoff in in/hr to cfs, multiply by 2.975. 1/ Prior to event beginning 10:47a.																

SELECTED RUNOFF EVENTS						La Crosse, Wisconsin Watershed CWA		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 19, 1952								
6-20-52	0.44	0	7-19-52	Control Plot Rainage		7-19-52		
6-23	4.10	1.39	7:35p	0	0	7:43p	0	0
6-24	.53	.06	:37	5.40	.18	:48	.0191	T
6-25	.18	0	:43	1.80	.36	:52	.0868	T
6-27	.48	0	:53	3.96	1.02	:54	.172	.01
7-2	.08	.01	8:00	3.17	1.39	:58	.673	.03
7-3	.55	0	:05	3.24	1.66	8:02	1.58	.10
7-7	.96	.04	:11	3.10	1.97	:05	2.12	.20
7-13	.40	0	:17	3.50	2.32	:07	2.26	.27
7-14	.65	0	:20	3.80	2.51	:10	2.34	.38
7-18	.08	0	:26	1.40	2.65	:16	2.49	.63
7-19 <u>1</u>	.67	.04	:37	.71	2.78	:20	2.64	.80
			:42	1.92	2.94	:23	2.98	.94
			:48	.80	3.02	:26	3.53	1.10
			:56	1.58	3.23	:27	3.53	1.16
			9:06	.54	3.32	:30	3.02	1.33
			:33	.04	3.34	:34	1.89	1.49
Watershed Conditions						:38	1.22	1.60
Six strips on 2% grade. Lowest						:42	.791	1.67
strip in hay, then alternate strips						:46	.603	1.71
in corn and hay.								
						:51	.536	1.75
						:56	.673	1.81
						:58	.710	1.83
						9:03	.637	1.90
						:09	.637	1.95
						:13	.504	1.98
						:17	.337	2.01
						:23	.156	2.03
						:29	.0652	2.04
						:38	.0220	2.06
						11:00	0	2.07
Event of August 26-27, 1959								
7-28-59	0.06	0	8-26-59	Control Plot Rainage		8-26-59		
7-30	.35	0	9:35p	0	0	10:25p	0	0
8-2	.19	0	:44	.60	.09	:30	.0513	T
8-3	2.52	.16	:48	1.20	.17	:36	.140	.01
8-6	1.10	0	:55	.09	.18	:43	.164	.03
8-10	.08	0	:59	.60	.22	:53	.0989	.05
8-11	.12	0	10:02	.60	.25	11:03	.198	.07
8-14	.13	0	:07	4.08	.59	:13	.403	.12
8-15	.45	0	:14	1.29	.74	:20	.474	.18
8-16	.89	0	:21	3.94	1.20	:24	.730	.22
8-21	.54	0	:24	1.80	1.29	:27	1.55	.27
8-22	.20	0	:28	6.15	1.70	:29	1.93	.32
8-26 <u>2</u>	.03	0	:32	1.80	1.82	:31	2.30	.39
			:36	.90	1.88	:33	2.12	.47
			:41	.36	1.91	:35	1.76	.54
			:46	1.56	2.04	:39	1.09	.63
			:56	2.82	2.51	:45	.536	.72
			11:04	2.70	2.87	:53m	.226	.73
			:11	1.63	3.06	8-27-59		
			:15	1.95	3.19	12:00a	.106	.78
			:23	5.48	3.92	1:00	0	.79
			:30	4.03	4.39			
			:34	1.35	4.48			
			12:00p	.25	4.59			
			8-27-59					
			12:10a	.36	4.65			
			:16	.50	4.70			
Watershed Conditions								
100% hay								
Notes: To convert runoff in in/hr. to cfs, multiply by 2.975. <u>1/</u> Prior to event beginning 7:35p. <u>2/</u> Prior to event beginning 9:35 p, 8-26. The map for this watershed is included with LaCrosse, Wisconsin Watershed CW, page 32.3-6.								



LA CROSSE, WISCONSIN WATERSHED CWA





LA CROSSE, WISCONSIN WATERSHED CWA

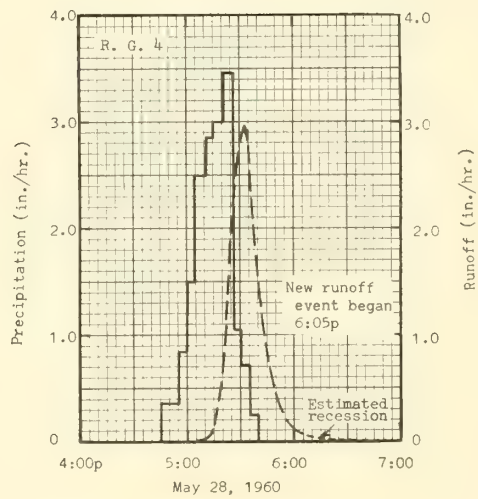
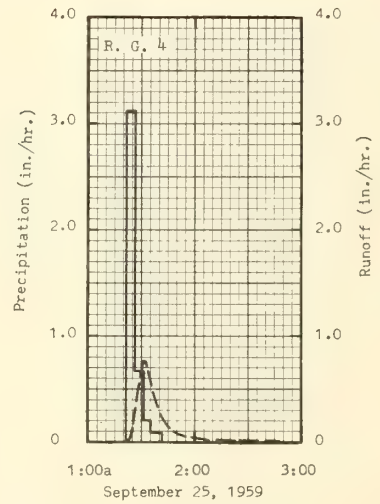
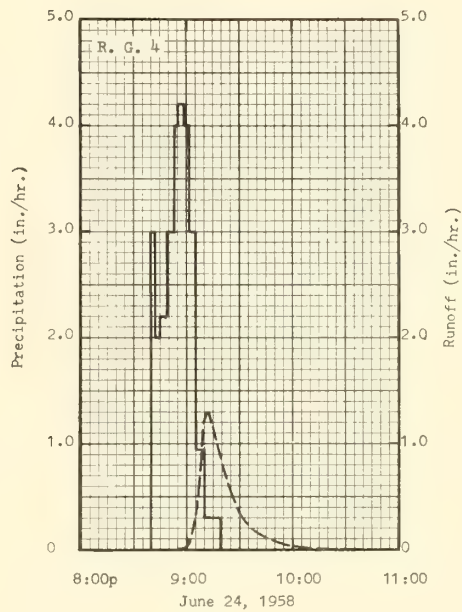


MONTHLY PRECIPITATION AND RUNOFF (Inches)								Cherokee, Oklahoma Watershed W-1 (Area - 2.23 acres)								
Month Year		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	0.11	0.10	0.51	0.34	1.12	2.42	2.17	1.88	0.25	0.89	0.44	1.04	11.27		
	Q	0	0	0	0	0	T	0	T	0	0	0	0	T		
1957	P	.75	1.01	3.73	7.16	10.74	7.60	2.17	.54	6.26	2.48	1.37	.16	43.97		
	Q	0	0	0	2.63	3.81	2.19	nr	0	.03	0	0	0	8.66		
1958	P	.73	.09	2.20	1.76	1.80	5.88	4.41	2.58	3.45	.41	.92	.26	24.49		
	Q	T	0	.03	.05	0	1.71	.67	0	.49	0	0	0	2.95		
1959	P	.18	.11	1.91	2.92	6.41	1.86	.63	1.74	5.72	4.95	.12	1.09	27.64		
	Q	0	0	.02	.36	1.74	.01	0	0	.62	1.38	0	0	4.13		
1960	P	1.11	1.56	.78	.85	4.72	3.50	1/						12.52		
	Q	.06	.24	0	0	1.34	.76	1/						2.40		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Cherokee, Oklahoma Watershed W-1								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958	6-25	1.51	6-25	1.08	6-25	1.26	6-25	1.29	6-24	1.71	6-24	1.71	6-24	1.71	6-21	1.71
1959	10-2	2.52	5-26	1.46	5-25	1.57	5-25	1.64	5-25	1.64	5-25	1.64	5-25	1.64	9-24	1.83
1960	5-28	2.97	5-28	.99	5-28	1.32	5-28	1.33	5-28	1.34	5-28	1.34	5-28	1.34	5-28	1.34
Notes: Quality of records: P-good, Q-good. 1/ Watershed discontinued June 30, 1960. Watershed Conditions: Continuous wheat 1956-60. Tillage: 1956,57- chiseling 6 inches deep; 1958-8 foot sweep 4 inches deep; 1959-8 foot sweep 3 inches deep. All years disc and spring tooth harrows used as necessary for weed control.																
SELECTED RUNOFF EVENTS								Cherokee, Oklahoma Watershed W-1								
Antecedent conditions				Rainfall					Runoff							
Date	Rainfall (inches)		Runoff (inches)	Date and time	Intensity (in/hr)		Acc. (inches)	Date and time	Rate (in/hr)		Acc. (inches)					
Event of June 24, 1958																
5-29-58	0.73		0	6-24-58	Raingage		4	6-24-58								
6-16	1.30		0	8:40p	0		0	8:56p	0		0					
6-18	.08		0	:42	3.00		.10	:57	.006		T					
6-20	.29		0	:45	2.00		.20	:58	.010		T					
6-21	.63		T	:48	2.20		.31	:59	.010		T					
6-22	.08		0	:52	3.00		.51	9:01	.042		T					
				:55	4.00		.71	:02	.086		T					
				:58	4.20		.92	:04	.234		.01					
				9:01	4.00		1.12	:06	.451		.02					
				:05	3.00		1.32	:08	.872		.04					
Watershed Conditions: 100% of area in wheat stubble. Wheat harvested 6-14.																
				:10	.96		1.40	:09	1.14		.06					
				:18	.30		1.44	:11	1.29		.10					
								:12	1.29		.12					
								:13	1.27		.14					
								:15	1.14		.18					
								:17	1.02		.22					
								:19	.849		.25					
								:23	.623		.30					
								:27	.466		.33					
								:31	.333		.36					
								:39	.179		.39					
								:44	.104		.40					
								:52	.050		.42					
								10:00	.027		.42					
								:08	.015		.42					
								:18	.006		.42					
								:26	.003		.42					
								:36	.001		.42					
								:54	0		.43					
Notes: To convert runoff in in/hr to cfs multiply by 2.488.																

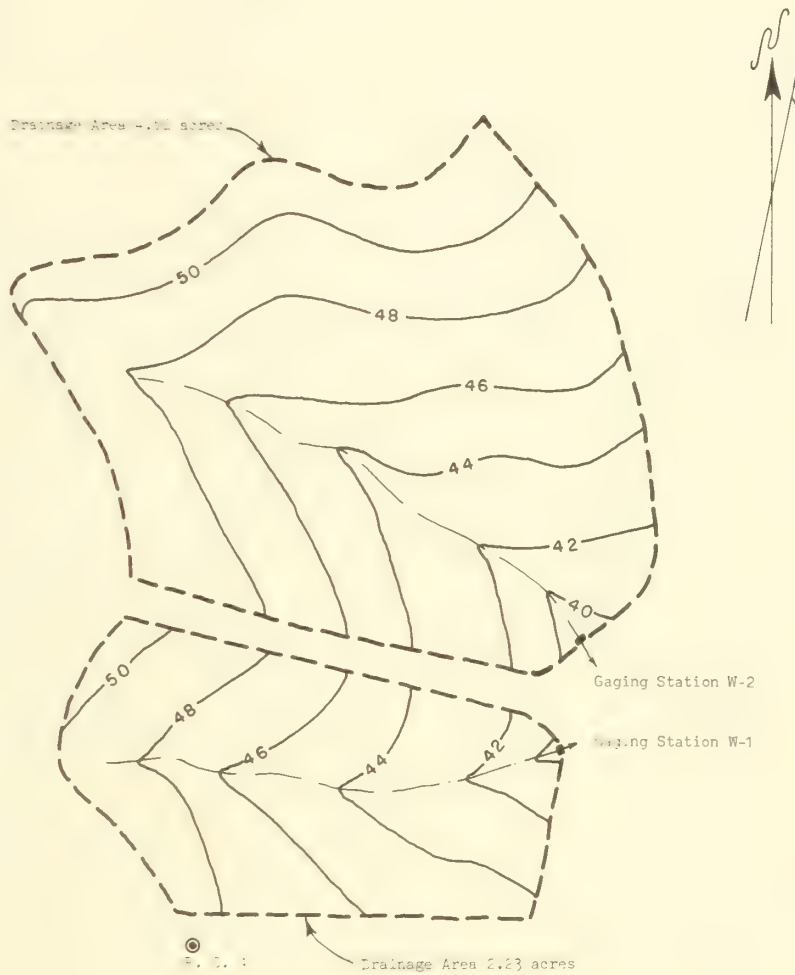
Cooperative Research Project of USDA and Oklahoma Agricultural Experiment Station

SELECTED RUNOFF EVENTS						Cherokee, Oklahoma Watershed W-1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 25, 1959								
8-28-59	T	0	9-25-59	Raingage	4	9-25-59		
8-30	.37	0	1:22a		0	1:22a	0	0
9-3	.76	0	:27	3.12	.26	:23	.005	T
9-17	.12	0	:32	.72	.32	:24	.034	T
9-22	.70	0	:35	.20	.33	:25	.104	T
9-23	.26	0	:42	.09	.34	:26	.215	T
9-24	3.24	.441				:27	.321	.01
Watershed Conditions: 10 % of area fallow. Offset disk plowed 8-13. Spring tooth harrowed 9-9.						:28	.423	.01
						:29	.543	.02
						:30	.605	.03
						:31	.694	.04
						:32	.769	.06
						:34	.676	.08
						:36	.510	.10
						:38	.396	.11
						:42	.192	.13
						:46	.132	.14
						:48	.080	.15
						:50	.080	.15
						:54	.046	.15
						:58	.034	.16
						2:02	.021	.16
Event of May 24, 1960								
4-28-60	0.01	0	5-28-60	Raingage	4	5-28-60		
5-3	.20	0	4:45p		0	:04p	0	0
5-4	.35	0	:55	.36	.03	:05	.001	T
5-5	.12	0	5:00	.84	.10	:06	.003	T
5-6	.10	0	:04	1.50	.20	:07	.006	T
5-17	.73	0	:11	2.49	.49	:09	.013	T
5-20	.24		:15	2.85	.68	:10	.021	T
5-24	.57		:21	3.00	.98	:11	.034	T
5-28	.32	0	:26	3.48	1.27	:13	.086	T
Watershed Conditions: 10 % of area in wheat in rough stage. Good stand.						:14	.124	T
						:15	.179	.01
						:17	.333	.02
						:19	.556	.03
						:21	.934	.05
						:23	1.51	.10
						:27	2.48	.23
						:31	2.88	.41
						:33	2.97	.51
						:34	2.84	.56
						:36	2.40	.64
						:40	1.60	.78
						:44	.934	.86
						:48	.605	.92
						:52	.357	.95
Event of May 25, 1960								
						1:05	.064	.98
						:11	e .032	e .99
						:16	e .016	e .99
						:22	e .008	e .99
						:28	e .004	e .99
						:32	e .002	e .99
						:38	e .001	e .99
						7:00	e 0	e .99

Notes: To convert runoff in in/hr to cfs, multiply by 2.2466. 1/ New runoff event began 6:05p. Recession estimated.



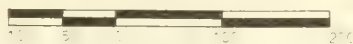
CHEROKEE, OKLAHOMA Watershed W-1



LEGEND

- Watershed Boundary
- Natural Waterway
- 44 — Contours
- ⬇ Gaging Station
- ⊙ Recording Raingage

Scale in Feet



Contour Interval 2 Feet

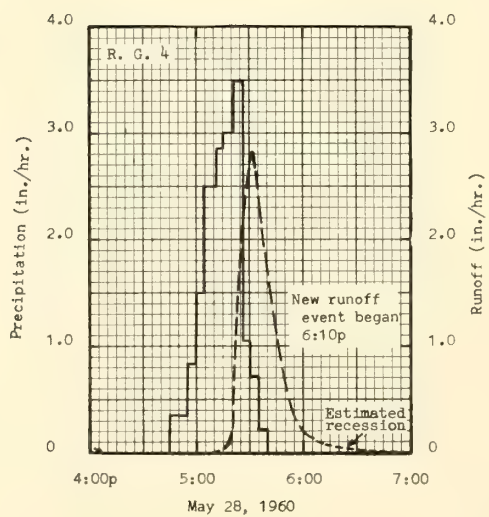
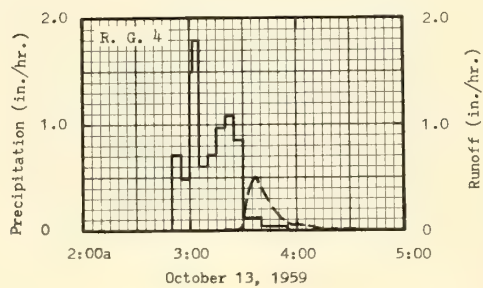
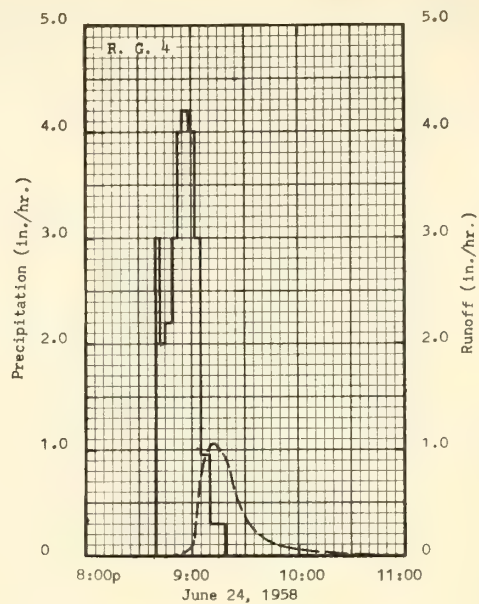
CHEROKEE, OKLAHOMA

Watersheds W-1, W-2



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Cherokee, Oklahoma Watershed W-2 (Area - 4.82 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	0.11 0	0.10 0	0.51 0	0.34 0	1.12 0	2.42 T	2.17 0	1.88 C	0.25 0	0.89 0	0.44 0	1.04 0	11.27 T			
1957 P Q	.75 0	1.01 0	3.73 T	7.16 2.63	10.74 4.29	7.60 2.49	2.17 .87	.54 0	6.26 .01	2.48 0	1.37 0	.16 0	43.97 10.29			
1958 P Q	.73 T	.09 0	2.20 T	1.76 .03	1.80 T	5.88 1.66	4.41 .45	2.58 T	3.45 .36	.41 0	.92 0	.26 0	24.49 2.50			
1959 P Q	.18 0	.11 0	1.91 .02	2.92 .43	6.41 1.91	1.86 T	.63 0	1.74 0	5.72 .67	4.95 1.40	.12 0	1.09 0	27.64 4.44			
1960 P Q	1.11 .03	1.56 .16	.78 0	.85 0	4.72 1.35	3.50 .73	1/ T						12.52 2.27			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Cherokee, Oklahoma Watershed W-2								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958	6-25	1.32	6-25	1.00	6-25	1.17	6-25	1.20	6-24	1.66	6-24	1.66	6-24	1.66	6-21	1.66
1959	5-26	2.45	5-26	1.44	5-25	1.62	5-25	1.77	5-25	1.78	5-25	1.78	5-25	1.78	9-24	1.92
1960	5-28	2.82	5-28	.97	5-28	1.35	5-28	1.35	5-28	1.35	5-28	1.35	5-28	1.35	5-28	1.35
Notes: Quality of records: P-good, Q-good. 1/ Watershed discontinued June 30, 1960. Watershed Conditions: Continuous wheat 1956-60. Tillage: 1956,57- chiseling 6 inches deep; 1958- 8 foot sweep 4 inches deep; 1959- 8 foot sweep 3 inches deep. All years disc and spring tooth harrows used as necessary for weed control.																
SELECTED RUNOFF EVENTS								Cherokee, Oklahoma Watershed W-2								
Antecedent conditions			Rainfall				Runoff									
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of June 24, 1958																
5-29-58	0.73	T	6-24-58	Raingage	4	6-24-58										
6-16	1.30	T	8:40p	0	0	8:41p	0	0								
6-18	.08	0	:42	3.00	.10	:42	.003	T								
6-20	.29	0	:45	2.00	.20	:44	.003	T								
6-21	.63	.020	:48	2.20	.31	:45	.004	T								
6-22	.08	0	:52	3.00	.51	:46	.003	T								
			:55	4.00	.71	:47	.004	T								
			:58	4.20	.92	:49	.007	T								
			9:01	4.00	1.12	:50	.011	T								
			:05	3.00	1.32	:54	.025	T								
Watershed Conditions: 100% of area in wheat stubble. Wheat harvested 6-14.																
			:10	.96	1.40	:56	.035	T								
			:18	.30	1.44	:58	.043	T								
						9:00	.068	.01								
						:02	.165	.01								
						:03	.251	.01								
						:05	.648	.03								
						:07	.840	.05								
						:11	1.04	.12								
						:13	1.06	.15								
						:14	1.04	.17								
						:17	.963	.22								
						:20	.885	.27								
						:25	.586	.33								
						:30	.393	.37								
						:40	.183	.41								
						:50	.091	.44								
						10:00	.048	.45								
						:20	.013	.46								
						:45	.002	.46								
						11:16	T	.46								
						:46	0	.46								
Notes: To convert runoff in in/hr to cfs multiply by 4.6002. For map of watershed see page 34.1-4.																

SELECTED RUNOFF EVENTS			Cherokee, Oklahoma Watershed W-2					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of October 13, 1959								
9-17-59	0.12	0	10-13-59	Raingage	4	10-13-59		
9-22	.70	0	2:50a	0	0	3:19a	0	0
9-23	.26	0	:55	.72	.06	:25	.001	T
9-24	3.24	.514	3:00	.48	.10	:26	.002	T
9-25	.34	.158	:02	1.50	.15	:28	.006	T
9-29	.04	0	:05	1.80	.24	:29	.032	T
9-30	.41	0	:10	.60	.29	:30	.083	T
10-1	1.12	.226	:15	.72	.35	:31	.138	T
10-2	1.66	1.065	:20	.96	.43	:33	.313	.01
10-3	.12	0	:25	1.08	.52	:35	.442	.02
10-4	.30	0	:30	.84	.59	:37	.506	.04
10-13	1/ .22		:40	.12	.60	:39	.453	.06
			:55	.04	.61	:41	.383	.07
Watershed Conditions: 100% of area						:45	.251	.09
fallow. Spring tooth harrowed 10-10.						:49	.143	.10
						:53	.087	.11
						:57	.054	.12
						4:01	.045	.12
						:05	.025	.12
						:09	.014	.12
						:13	.008	.12
						:23	.003	.12
						:32	.001	.12
						5:03	0	.12
Event of May 28, 1960								
4-28-60	0.01	0	5-28-60	Raingage	4	5-28-60		
5-3	.20	0	4:45p	0	0	5:04p	0	0
5-4	.35	0	:55	.36	.03	:05	T	T
5-5	.12	0	5:00	.84	.10	:06	.001	T
5-6	.1	0	:04	1.50	.20	:08	.002	T
5-17	.73	0	:11	2.49	.49	:10	.005	T
5-20	.24	0	:15	2.85	.68	:14	.018	T
5-24	.57	0	:21	3.00	.98	:16	.037	T
5-28	.32	0	:26	3.48	1.27	:18	.083	T
			:30	1.05	1.34	:19	.138	.01
Watershed Conditions: 100% of area			:35	.72	1.40	:20	.209	.01
in wheat in dough stage. Good stand.			:41	.24	1.42	:22	.529	.02
						:23	.854	.03
						:24	1.37	.05
						:25	1.78	.08
						:28	2.55	.19
						:32	2.82	.37
						:36	2.32	.54
						:38	2.04	.62
						:40	1.73	.68
						:44	1.20	.78
						:48	.782	.84
						:52	.484	.88
						:56	.296	.91
						6:00	.183	.93
						2/ :10	.108	.95
						:18	e .050	e .96
						:26	e .024	e .96
						:34	e .012	e .97
						:41	e .005	e .97
						:49	e .003	e .97
						7:01	e .001	e .97
						:40	e 0	e .97
Notes: To convert runoff in in/hr to cfs multiply by 4.6602. 1/ Prior to event beginning 2:50a. Antecedent rainfall ended 2:40a. 2/ New runoff event began 6:10p. Recession estimated.								



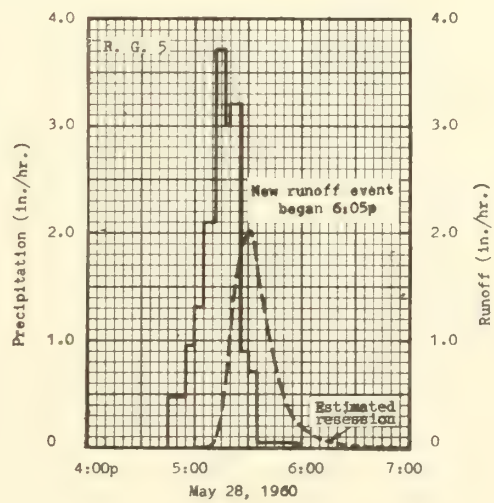
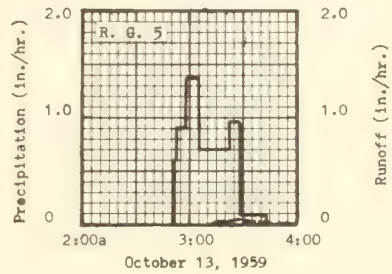
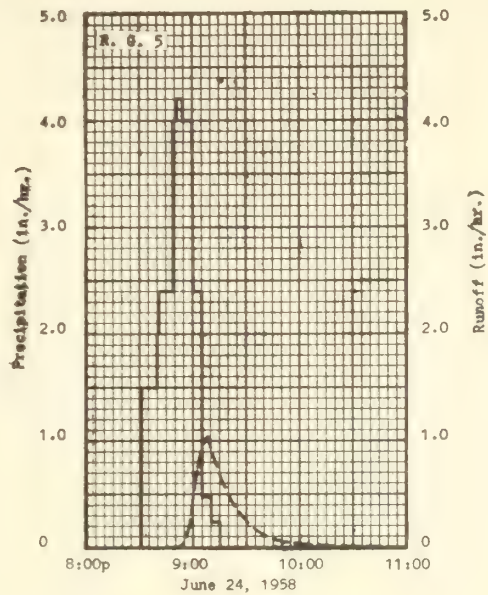
CHEROKEE, OKLAHOMA Watershed W-2

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Cherokee, Oklahoma Watershed W 3 (Area - 8.04 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1956	P	0.11	0.11	0.52	0.35	1.09	2.18	2.26	1.98	0.19	0.82	0.43	1.02	11.06		
	Q			0		0	T	0	0		0		0	T		
1957	P	.73	1.00	3.86	7.09	10.78	7.54	2.17	.56	6.23	2.53	1.45	.18	44.12		
	Q	0	0	T	e 2.84	4.61	2.43	.94	0	.02		0	0	10.84		
1958	P	.68	.09	2.16	1.79	1.76	5.90	4.13	3.03	3.33	.37	.90	.29	24.43		
	Q	0	0	T	.03	T	1.43	.32	T	.18	0	0	0	1.9e		
1959	P	.19	.12	2.00	3.03	6.41	1.1	.61	1.62	6.34	5.13	.12	1.12	28.50		
	Q	0	0	.01	.26	1.34	.01	0	0	.68	1.14	0	0	3.43		
1960	P	1.18	1.62		.90	4.73	3.40							12.61		
	Q	.01	.13		0	1.3	.66	1						2.05		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Cherokee, Oklahoma Watershed W-3								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958	6-25	1.23	6-25	0.83	6-25	0.98	6-25	1.0	6-24	1.42	6-24	1.42	6-24	1.42	6-16	1.43
1959	5-26	1.99	5-26	1.07	5-25	1.17	5-25	1.25	5-25	1.25	5-25	1.25	5-25	1.25	9-24	1.63
1960	5-28	2.02	5-28	.82	5-28	1.24	5-28	1.25	5-28	1.25	5-28	1.25	5-28	1.25	5-28	1.25
Notes: Quantity of runoff: P - inches, Q - cfs. 1. Watershed discontinued June 30, 1960. Watershed Conditions: Continuous wheat 1956-60. Tillage: 1956,57- chiseling 6 inches deep; 1958- 8 foot sweep 4 inches deep; 1959- 8 foot sweep 3 inches deep. All years disc and spring tooth harrows used as necessary for weed control.																
SELECTED RUNOFF EVENTS								Cherokee, Oklahoma Watershed W-3								
Antecedent conditions			Rainfall					Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of June 24, 1958																
5-29-58	0.76	0.002	6-24-58	Raingage	5	6-24-58										
6-18	1.23	.002	8:36p	0	0	8:45p	0	0								
6-18	.08	0	:40	1.50	.10	:46	.001	T								
6-20	.39		:43	2.00	.20	:47	.002	T								
6-21	.64	.005	:48	2.40	.40	:49	.004	T								
6-22	.05	0	:51	4.00	.60	:51	.008	T								
			:54	4.20	.81	:53	.016	T								
			9:00	4.00	1.21	:55	.053	T								
			:05	2.40	1.41	:56	.097	T								
			:10	.48	1.45	:57	.154	.01								
			:15	.24	1.47	:59	.330	.01								
						9:01	.498	.02								
						:03	.709	.04								
						:05	.936	.07								
						:08	1.02	.12								
						:11	.909	.17								
						:14	.765	.21								
						:17	.624	.25								
						:20	.508	.28								
						:25	.352	.31								
						:31	.239	.34								
						:41	.116	.37								
						:47	.064	.38								
						:59	.030	.39								
						10:15	.010	.39								
						:31	.004	.39								
						:53	.002	.40								
						11:07	.001	.40								
						:41	0	.40								
Notes: To convert runoff in in/hr to cfs multiply by 8,1070.																

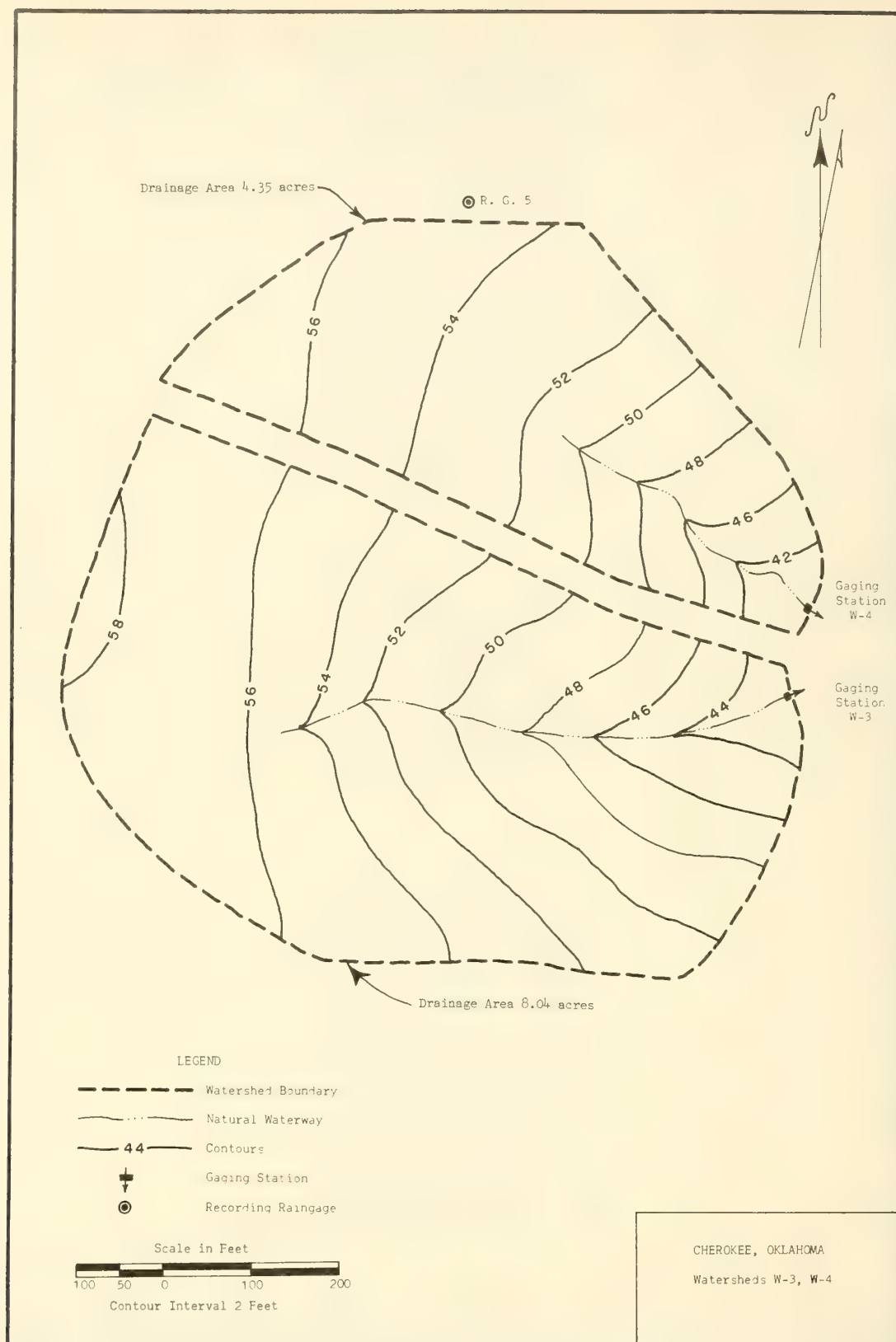
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SELECTED RUNOFF EVENTS						Cherokee, Oklahoma Watershed W-3		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of October 13, 1959								
9-17-59	0.13	0	10-13-59	Raingage	5	10-13-59		
9-22	.91	.005	2:51a	0	0	3:12a	0	0
9-23	.24	0	:52	.60	.01	:13	.002	T
9-24	3.43	.508	:58	.90	.10	:14	.014	T
9-25	.43	.166	3:05	1.38	.26	:15	.017	T
9-29	.02	0	:22	.70	.46	:18	.012	T
9-30	.43	0	:27	.96	.54	:20	.016	.02
10-1	1.08	.210	:42	.08	.56	:22	.024	.02
10-2	1.80	.801				:26	.037	.04
10-3	.08	0				:28	.050	.06
10-4	.36	0				:31	.037	.08
10-13	1/.26	0				:33	.026	.09
						:36	.014	.10
						:43	.006	.11
						:54	.003	.12
Watershed Conditions: 100% of area fallow. Spring tooth harrowed 10-10.						4:00	.001	.12
						:04	.001	.12
						:14	T	.12
						:26	T	.12
						:56	T	.12
						5:20	0	.12
Event of May 28, 1960								
4-28-60	0.02	0	5-28-60	Raingage	5	5-28-60		
5-3	.23	0	4:45p	0	0	5:02p	0	0
5-4	.33	0	:55	.48	.04	:04	T	T
5-5	.12	0	5:00	.96	.12	:05	.001	T
5-6	.09	0	:05	1.32	.23	:08	.006	T
5-17	.70	0	:11	2.10	.44	:09	.012	T
5-20	.24	0	:16	3.72	.75	:11	.064	T
5-24	.56	0	:20	3.00	.95	:13	.146	T
5-28	.34	0	:26	3.20	1.27	:15	.302	.05
			:30	.90	1.33	:16	.438	.06
			:35	.72	1.39	:18	.687	.07
Watershed Conditions: 100% of area in wheat in dough stage. Good stand.						:20	.948	.10
			:58	.05	1.41	:22	1.23	.14
						:24	1.52	.18
						:29	1.96	.33
						:31	2.02	.40
						:33	1.91	.46
						:35	1.71	.52
						:38	1.38	.60
						:46	.730	.74
						:50	.438	.76
						2/6:05	.137	.81
						:15	e .060	e .83
						:24	e .028	e .84
						:35	e .014	e .84
						:41	e .007	e .84
						:48	e .004	e .84
						:56	e .002	e .84
						7:04	e .001	e .84
						:50	e 0	e .84
Notes: To convert runoff in in/hr to cfs multiply by 8.1070. 1/ Prior to event beginning 2:51a. Antecedent rainfall ended 2:50a. 2/ New runoff event began 6:05p. Recession estimated.								



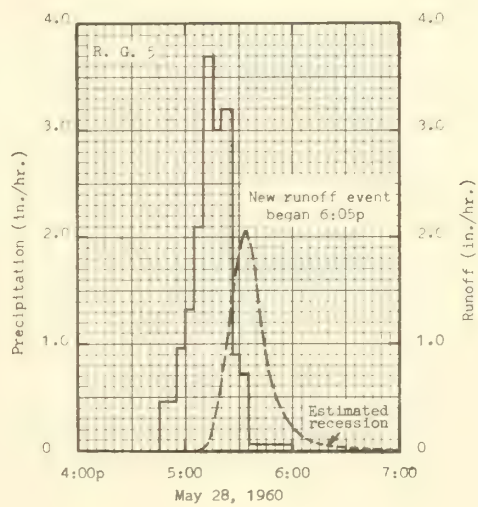
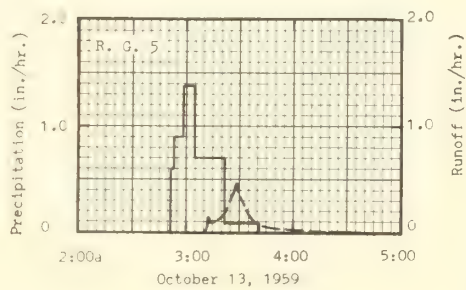
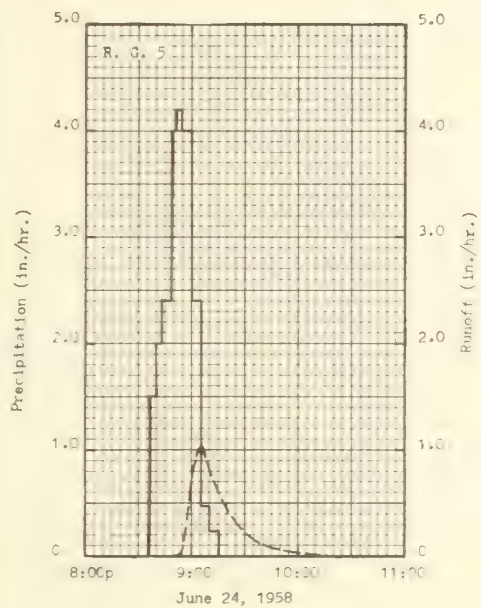
CHEROKEE, OKLAHOMA Watershed W-3



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Cherokee, Oklahoma Water hel W-4 (Area - 4.35 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P	0.11	0.11	0.52	0.35	1.09	2.18	2.26	1.98	0.19	0.82	0.43	1.02	11.06			
Q	0	0	0	0	0	T	0	.01	0	0	0	0	.01			
1957 P	1.13	1.00	3.86	5.14	10.78	7.54	2.17	.56	6.23	2.53	1.45	.18	44.12			
Q	0	0	.02	3.03	4.85	2.58	.93	0	T	0	0	0	11.41			
1958 P	1.11	1.11	2.16	1.79	1.76	5.90	4.13	3.03	3.33	.37	.90	.29	24.43			
Q	T	T	T	.02	.01	1.47	.26	T	.32	T	T	0	2.08			
1959 P	1.19	1.12	2.00	3.03	6.41	1.81	.51	1.62	6.34	5.13	.12	1.12	28.50			
Q	0	0	.01	.33	1.55	.02	0	0	.77	1.25	0	0	3.93			
1960 P	1.11	1.62	1.11	1.11	4.73	3.40	5.66	1.11	1/1	1.11	1.11	1.11	18.27			
Q	.01	.18	0	0	1.26	.64	.24	0	0	0	0	0	2.33			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Cherokee, Oklahoma Watershed W-4								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1956	6-25	1.33	6-25	0.77	6-25	0.92	6-25	1.07	6-24	1.45	6-24	1.45	6-24	1.45	6-16	1.47
1957	5-26	2.29	5-26	1.24	5-25	1.37	5-25	1.45	5-25	1.45	5-25	1.45	5-25	1.45	9-24	1.85
1960	5-28	2.05	5-28	.81	5-28	1.26	5-28	1.26	5-28	1.27	5-28	1.27	5-28	1.27	5-28	1.27
Notes: Quality of records: P-good, Q-good. 1/ Water hel discontinued August 3, 1960. Watershed Conditions: Continuous wheat 1956-60. Tillages: 1956, 57 - chisel 6 inches deep, 8 foot sweep 6 inches deep; 1958- 8 foot sweep 4 inches deep; 1959- 8 foot sweep 3 inches deep. All years disc and spring tooth harrows as necessary for weed control.																
SELECTED RUNOFF EVENTS								Cherokee, Oklahoma Watershed W-4								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of June 24, 1958																
5-29-58	0.76	0.007	6-24-58	Raingage	5	6-24-58										
6-18	1.23	.011	8:36p	0	0	8:50p	0	0								
6-19	0	0	4:40	1.50	.10	5:1	.002	T								
6-20	.39	0	4:45	2.00	.20	5:2	.005	T								
6-21	.64	.009	4:48	2.40	.40	5:3	.026	T								
6-22	.25	0	5:1	4.00	.60	5:5	.110	T								
			5:4	4.20	.81	5:6	.141	T								
Watershed Conditions: 100% of area in wheat stubble. Wheat harvested 6-14.																
			9:00	4.00	1.21	5:7	.217	.01								
			10:5	2.40	1.41	5:9	.513	.02								
			1:10	.48	1.45	9:01	.746	.04								
			1:15	.24	1.47	10:3	.914	.07								
						10:5	1.03	.10								
						10:6	1.03	.12								
						10:9	.898	.17								
						1:13	.663	.22								
						1:19	.456	.27								
						1:25	.310	.31								
						1:35	.147	.35								
						1:39	.120	.36								
						1:45	.071	.37								
						1:55	.033	.37								
						10:05	.014	.38								
						1:16	.003	.38								
						1:23	T	.38								
						1:29	0	.38								
Event of October 13, 1959																
9-17-59	0.13	0	10-13-59	Raingage	5	10-13-59										
9-22	.91	.13	2:51a	0	0	3:10a	0	0								
9-23	.24	0	5:2	.60	.01	1:1	T	T								
9-24	3.43	.753	5:8	.90	.10	1:2	.002	T								
9-25	.43	1/	3:05	1.38	.26	1:3	.152	T								
9-29	.02	0	1:22	.70	.4	1:5	.083	.01								
9-30	.43	0	1:27	.96	.54	1:7	.083	.01								
Notes: To convert runoff in in/hr to cfs multiply by 4.3862. For map of watershed see page 34.3-4. 1/ Runoff for 9-25 included in the estimate for 9-24.																



SELECTED RUNOFF EVENTS						Cherokee, Oklahoma Watershed W-4		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of October 13, 1959 - Continued								
10-1-59	1.08	0.311	10-13-59 3:42a	0.08	0.56	10-13-59 3:19a	0.100	0.01
10-2	1.80	.821				:23	.203	.02
10-3	.08	0				:27	.346	.04
10-4	.36	0				:29	.467	.05
10-13	<u>1/</u> .26	0				:33	.278	.08
Watershed Conditions: 100% of area fallow. Spring tooth harrowed 10-10.						:37	.130	.09
						:41	.053	.10
						:47	.036	.10
						:55	.017	.11
						4:03	.011	.11
						:13	.005	.11
						:39	<u>2/</u> .003	.11
Event of May 28, 1960								
4-28-60	0.02	0	5-28-60	Raingage	5	5-28-60		
5-3	.23	0	4:45p	0	0	5:07p	0	0
5-4	.33	0	:55	.48	.04	:08	.001	T
5-5	.12	0	5:00	.96	.12	:10	.012	T
5-6	.09	0	:05	1.32	.23	:12	.060	T
5-17	.70	0	:11	2.10	.44	:15	.177	.01
5-20	.24	0	:16	3.72	.75	:18	.406	.02
5-24	.56	0	:20	3.00	.95	:21	.775	.05
5-28	.34	0	:26	3.20	1.27	:23	1.03	.08
Watershed Conditions: 100% of area in wheat in dough stage. Good stand.						:26	1.31	.14
						:28	1.52	.18
						:32	1.89	.30
						:34	2.05	.37
						:36	1.94	.43
						:39	1.61	.52
						:41	1.39	.57
						:43	1.12	.61
						:47	.650	.67
						:51	.415	.71
						:57	.254	.74
						6:03	.147	.76
						<u>3/</u> :05	.130	.76
						:12	e .067	e .78
						:20	e .032	e .78
						:27	e .017	e .79
						:34	e .009	e .79
						:43	e .004	e .79
						:51	e .002	e .79
						:58	e .001	e .79
						7:40	e 0	e .79
Notes: To convert runoff in in/hr to cfs multiply by 4.3862. <u>1/</u> Prior to event beginning 2:51a. Antecedent rainfall ended 2:50a. <u>2/</u> Beginning of a new event. <u>3/</u> New runoff event began 6:05p. Recession estimated.								



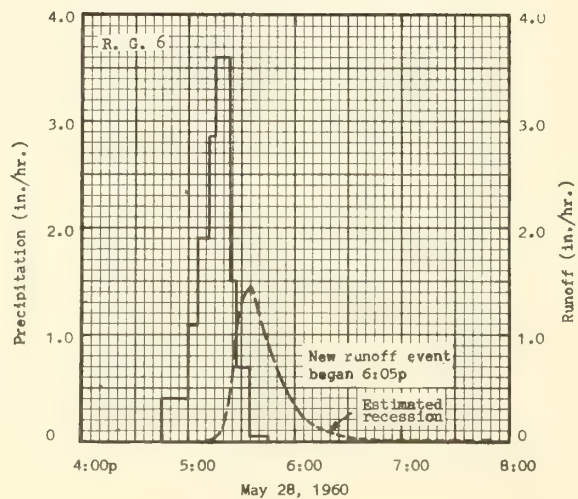
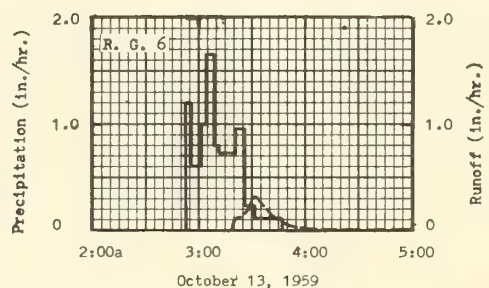
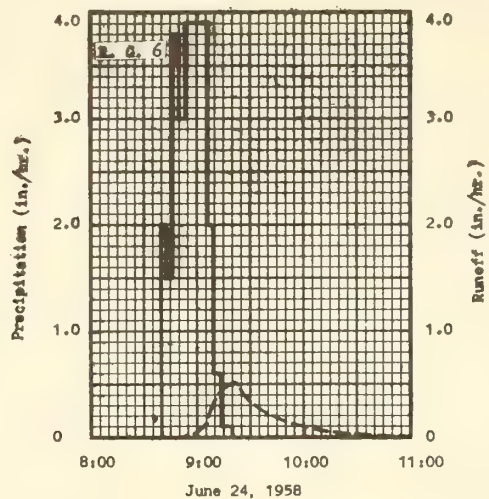
CHEROKEE, OKLAHOMA Watershed W-4

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Cherokee, Oklahoma Watershed W-5 (Area - 7.85 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P	0.11	0.11	0.52	0.33	1.10	2.16	2.33	1.97	0.17	0.83	0.44	1.06	11.13			
Q	0	0	0	0	0	0	0	T	0	0	0	0	T			
1957 P	.74	1.00	3.88	7.02	10.79	7.64	2.18	.54	6.14	2.45	1.39	.16	43.93			
Q	0	0	T	1.91	3.41	2.07	.78	0	.04	0	0	0	8.21			
1958 P	.78	.67	2.31	1.79	1.69	5.93	4.22	3.20	3.27	.37	.97	.33	24.93			
Q	T	0	.01	.02	0	1.23	.19	T	.07	0	T	0	1.52			
1959 P	.28	.12	1.96	3.09	6.07	1.74	.64	1.58	6.23	5.16	.12	1.18	28.17			
Q	0	0	0	.40	1.61	T	0	0	.62	1.40	0	0	4.03			
1960 P	1.17	1.74	.77	.91	4.45	3.19	5.60	2.62	1/				20.45			
Q	.04	.20	0	0	1.10	.62	.17	.02	1/				2.15			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Cherokee, Oklahoma Watershed W-5								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958	6-25	0.86	6-25	0.65	6-25	0.86	6-25	0.93	6-24	1.23	6-24	1.23	6-24	1.23	6-24	1.23
1959	5-26	2.06	5-26	1.23	5-25	1.38	5-25	1.50	5-25	1.51	5-25	1.51	5-25	1.51	9-24	1.89
1960	5-28	1.44	5-28	.68	5-28	1.07	5-28	1.09	5-28	1.09	5-28	1.09	5-28	1.09	5-28	1.10
Notes: Quality of records P-good, Q-good. 1/ Watershed discontinued August 3, 1960. Watershed Conditions: Continuous wheat 1956-60. Tillage: 1956,57- chisel 6 inches deep; 1958- 8 foot sweep 4 inches deep; 1959- 8 foot sweep 3 inches deep. All years disc and spring tooth harrows as necessary for weed control.																
SELECTED RUNOFF EVENTS								Cherokee, Oklahoma Watershed W-5								
Antecedent conditions			Rainfall						Runoff							
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of June 24, 1958																
5-29-58	0.73	0	6-24-58	Raingage	6	6-24-58										
6-16	1.23	0	8:40p	0	0	8:47p	0	0								
6-18	.08	0	:43	2.00	.10	:48	T	T								
6-20	.41	0	:47	1.50	.20	:50	.003	T								
6-21	.51	0	:50	3.80	.39	:52	.006	T								
6-22	.05	0	:54	3.00	.59	:54	.010	T								
			9:06	3.90	1.37	:57	.021	T								
			:09	2.00	1.47	9:01	.060	T								
			:13	.60	1.51	:04	.119	.01								
			:20	.09	1.52	:07	.193	.02								
Watershed Conditions: 100% of area in wheat stubble. Wheat harvested 6-14.																
						:11	.384	.03								
						:17	.475	.08								
						:22	.457	.12								
						:27	.376	.15								
						:31	.317	.18								
						:43	.210	.23								
						10:04	.082	.27								
						:19	.039	.29								
						:49	.012	.30								
						11:03	.006	.30								
						:31	.003	.30								
						:51	.001	.30								
						12:00	T	.30								
						6-25-58										
						:03a	T	.30								
						:31	G	.30								
Event of October 13, 1959																
9-17-59	0.13	0	10-13-59	Raingage	6	10-13-59										
9-22	.81	0	2:52a	0	0	3:15a	0	0								
9-23	.28	0	:56	1.20	.08	:19	.066	T								
9-24	3.51	.466	3:01	.60	.13	:20	.108	T								
Notes: To convert runoff in in/hr to cfs multiply by 1.484																

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SELECTED RUNOFF EVENTS			Cherokee, Oklahoma			Water shed W-5		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of October 13, 1959 - Continued								
9-25-59	0.20	0.154	10-13-59			10-13-59		
9-29		0	3:04a	1.00	0.18	3:24a	0.131	.1
9-30	.44		:08	1.65	.29	:30	.283	.03
10-1	.62	.197	:11	.80	.33	:32	.322	.04
			:21	.72	.45	:34	.245	.06
10-2	2.32	1.10	:26	.96	.53	:44	.107	.08
10-3	.09	0	:31	.24	.55	:48	.066	.09
10-4	.36	0	:46	.12	.58	:54	.037	.10
10-5	1/ .22	0				4:00	.023	.10
						:08	.011	.10
Went into fallow. Spring tooth harrowed 10-10.								
						:11	.006	.10
						:30	.003	.10
						:58	.001	.10
						5:06		.10
						:32		.10
Event of May 28, 1960								
5-3	0.01	0	5-28-60	Raingage	6	5-28-60		
5-3	.22	0		0	0	5:58p	0	0
5-5	.41	0	5:00	.40	.10	:00		
5-6		0	:05	1.08	.19	:01	.001	.1
5-17	.65	0	:11	1.90	.38	:05	.001	.1
5-20	.23	0	:18	2.85	.57	:08	.001	.1
5-20	.55	0	:27	3.60	1.05	:10	.005	.1
5-28	.32	0	:34	1.50	1.15	:16	.033	.1
			:45	.69	1.23	:18	.001	.1
				.05	1.24	:20	.001	.01
Went into fallow. Spring tooth harrowed 5-28.								
						:24	.502	.03
						:27	.844	.06
						:30	1.24	.11
						:33	1.11	.18
						:35	1.44	.23
						:37	1.36	.27
						:40	1.20	.36
						:45	.959	.43
						:51	.639	.51
						:59	.352	.57
						:05	.232	.60
						:10	.158	.61
						:20	.076	.63
						:30	.037	.64
						:40	.001	.65
						:58	.010	.65
						7:05	.005	.65
						:20	.001	.65
						:50		.65



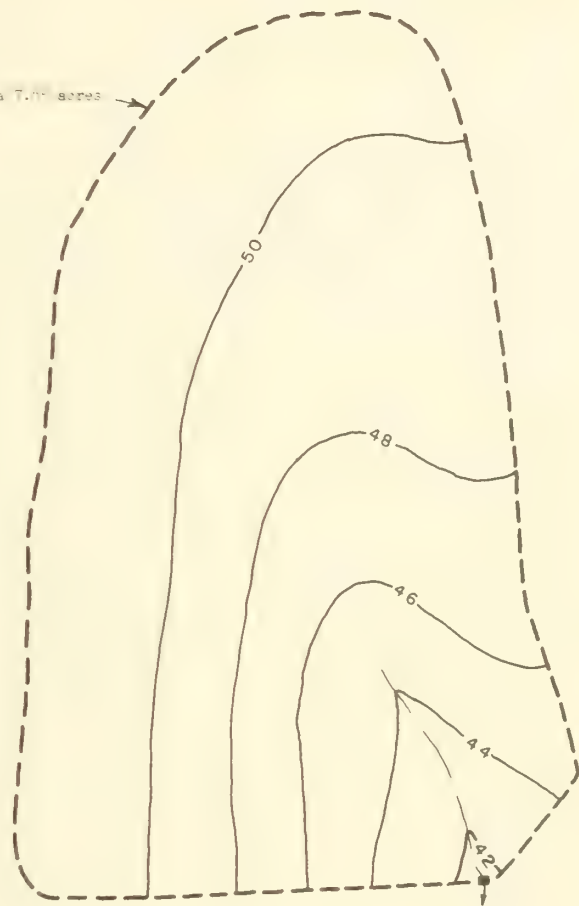


CHEROKEE, OKLAHOMA Watershed W-5

Drainage Area 7.0<sup>00</sup> acres



U. S. G.

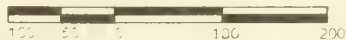


Gaging Station W-5

LEGEND

- Watershed Boundary
- Natural Waterway
- 44 — Contour
- ⊕ Gaging Station
- ⊙ Recording Raingage

Scale in Feet



Contour Interval 2 Feet

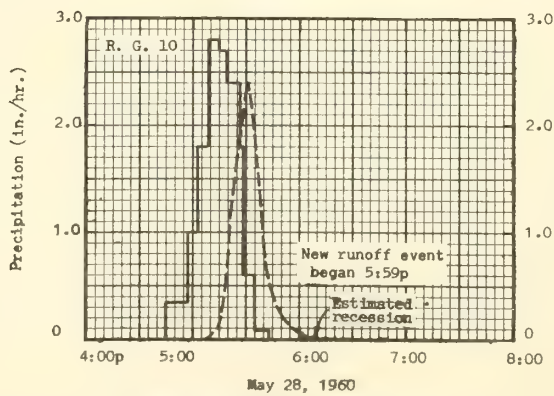
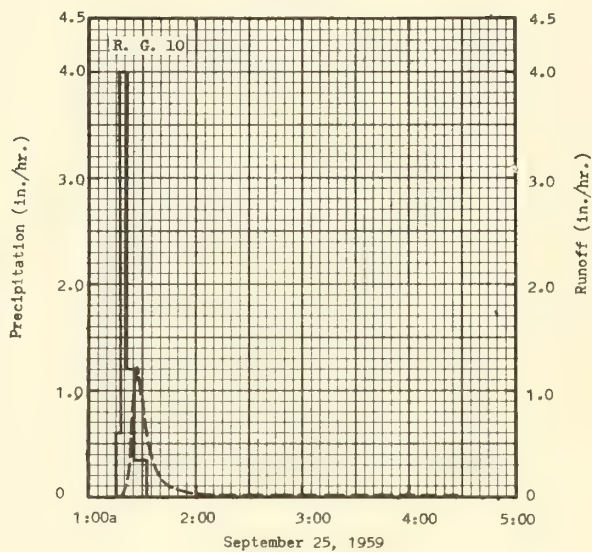
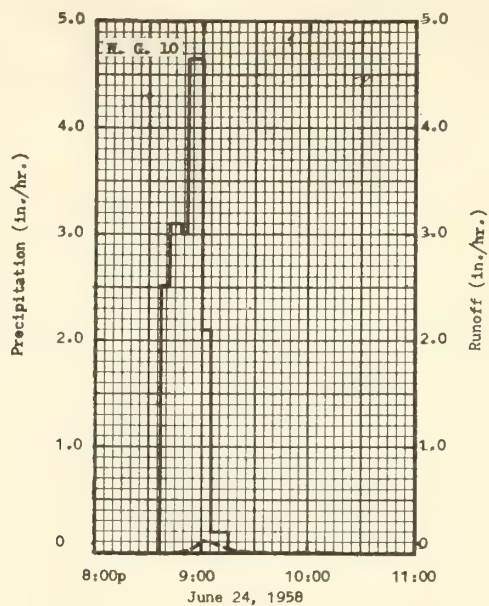
CHEROKEE, OKLAHOMA

Watershed W-5

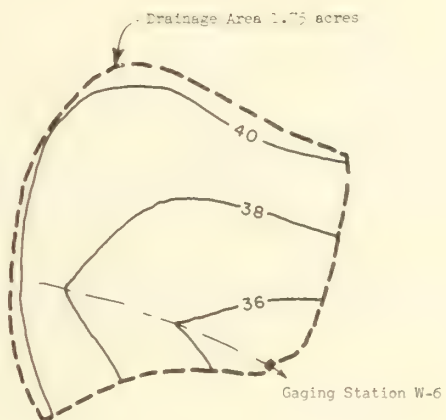
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Cherokee, Oklahoma Watershed W-6 (Area - 1.75 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1956 P Q	0.11 0	0.12 0	0.50 0	0.34 0	1.07 0	2.20 T	2.51 0	2.07 .04	0.17 0	0.81 T	0.45 0	1.00 0	11.35 .04			
1957 P Q	.73 0	1.02 0	3.81 T	7.17 2.76	10.62 3.61	8.11 3.51	2.21 1.07	.55 0	6.41 .10	2.42 0	1.48 0	.16 0	44.69 11.05			
1958 P Q	.76 0	.08 0	2.28 0	1.85 T	1.76 0	6.24 1.41	4.23 .30	3.17 .01	2.99 .20	.35 0	.98 0	.33 0	25.02 1.92			
1959 P Q	.24 0	.12 0	1.95 .01	3.09 .37	6.40 1.80	1.61 T	.58 0	1.60 0	5.91 1.03	5.01 1.38	.13 0	1.16 0	27.80 4.59			
1960 P Q	1.16 .03	1.82 .12	.82 0	.90 0	4.52 1.14	3.23 .50	1/ T						12.45 1.79			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Cherokee, Oklahoma Watershed W-6								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958	6-25	1.45	6-25	0.88	6-25	0.96	6-25	0.97	6-24	1.41	6-24	1.41	6-24	1.41	6-24	1.41
1959	10-2	2.48	5-26	1.36	5-25	1.54	5-25	1.68	5-25	1.69	5-25	1.69	5-25	1.69	9-24	2.30
1960	5-28	2.40	5-28	.77	5-28	1.15	5-28	1.15	5-28	1.15	5-28	1.15	5-28	1.15	5-28	1.15
Notes: Quality of records: P-good, Q-good. 1/ Watershed discontinued July 1, 1960. Watershed Conditions: Continuous wheat 1956-60. Tillage: 1956,57- chisel 6 inches deep; 1958-8foot sweep 4 inches deep; 1959 8 foot sweep 3 inches deep. All years disc and spring tooth harrows as necessary for weed control.																
SELECTED RUNOFF EVENTS								Cherokee, Oklahoma Watershed W-6								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of June 24, 1958																
5-29-58	0.74	0	6-24-58	Raingage	10	6-24-58										
6-16	1.31	0	8:37p	0	0	8:46p	0	0								
6-16	.07	0	:42	2.52	.21	:47		.001								
6-20	.50	0	:48	3.13	.52	:48		.003								
6-21	.63	0	:52	3.00	.72	:49		.006								
6-22	.05	0	9:00	4.65	1.34	:52		.015								
			:06	2.10	1.55	:55		.035								
			:15	.22	1.59	:57		.051								
						9:00		.099								
Water has been on : 100% of area in wheat stubble. Wheat harvested 6-14.																
						:04		.121								
						:06		.094								
						:15		.048								
						:19		.029								
						:25		.014								
						:33		.004								
						:39		.002								
						:51		.001								
						10:05		.001								
						:19										
Event of September 25, 1959																
8-28-59	0.02	0	9-25-59	Raingage	10	9-25-59										
8-30	.33	0	1:10	0	0	1:10										
9-3	.79	0	:18	0.60	.06	:18		.020								
9-17	.12	0	:11	4.00	.26	:20		.048								
9-22	.76	0	:25	1.20	.34	:21		.095								
9-23	.28	.002	:32	.34	.30	:22		.274								
9-24	3.11	.755				:23		.539								
						:24		.754								
						:27		1.22								
						:30		1.05								
Notes: To convert runoff in in/hr to cfs multiply by 1.7646.																

SELECTED RUNOFF EVENTS						Cherokee, Oklahoma Watershed W-6		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 25, 1959 - Continued								
						9:15-59		
						1:32a	0.650	0.16
						1:36	.324	.19
						1:40	.150	.20
						1:49	.064	.22
						1:56	.034	.22
						2:12	.117	.23
						2:48	.008	.23
						3:00	.008	.24
						4:28	.001	.24
						5:00		.24
Event of May 28, 1960								
4-28-60	0.01		5-28-60	Raingage	10	5-28-60		
5-3	.23		4:45p	0	0	4:45p		
5-4	.31		5:57	0.35	.07	5:57	.001	T
5-5	.12		5:03	1.00	.17	5:05	.001	T
5-6	.07		5:00	1.80	.35	5:00	.002	T
5-17	.65		5:10	2.80	.63	5:10	.006	T
5-20	.28		5:10	2.70	.81	5:11	.030	T
5-24	.53		5:00	2.40	1.09	5:10	.117	.01
5-28	.34		5:00	1.80	1.15	5:10	.424	.02
			5:00	.60	1.22	5:00	.754	.03
			5:40	.08	1.23	5:40	1.11	.07
						5:40	1.78	.18
						5:40	2.23	.25
						5:41	2.40	.32
						5:45	1.78	.46
						5:41	.816	.65
						5:47	.351	.65
						5:48	.117	.68
						5:50	.076	.68
						6:04	.038	.69
						6:04	.019	.69
						6:14	.010	.69
						6:17	.004	.69
						6:18	.001	.69
						6:20		.69
Watershed Conditions: 100% of area in wheat in dough stage. Good stand.								
Notes: The runoff in this event is the sum of the runoff from the preceding event and the runoff from the event itself.								



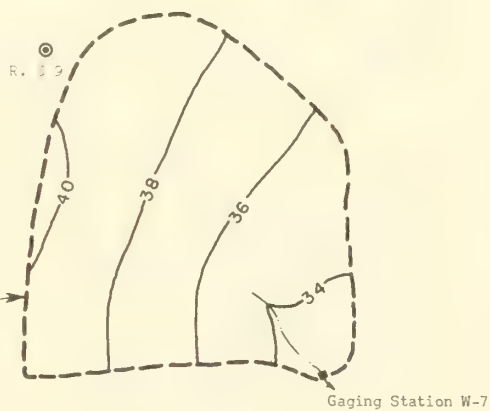


CHEROKEE, OKLAHOMA Watershed W-6



R. C. 11

Drainage Area 1.99 acres



# LEGEND

----- Watershed Boundary

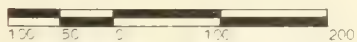
~~~~~ Natural Waterway

— 40 — Contours

⊕ Gaging Station

⊙ Recording Range

Scale in Feet



Contour Interval 2 Feet

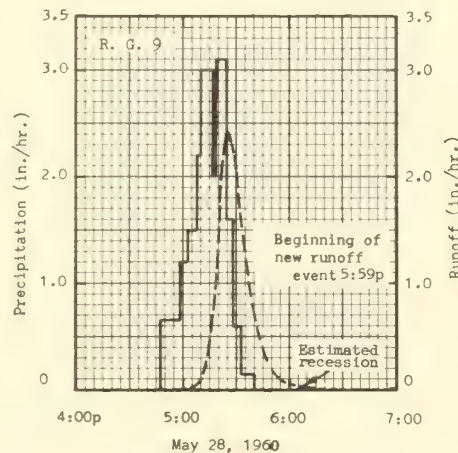
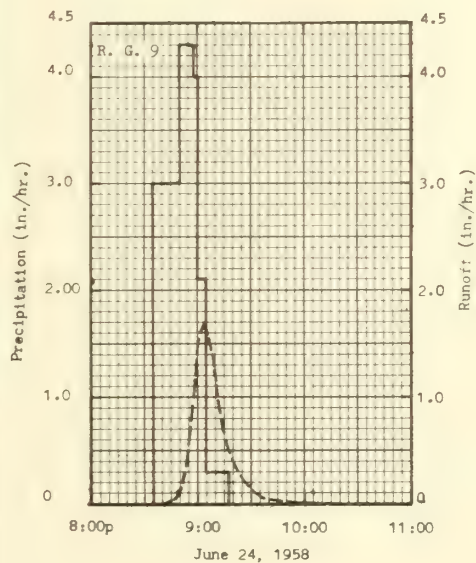
CHEROKEE, OKLAHOMA

Watersheds W-6, W-7

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |               |               |              | Cherokee, Oklahoma Watershed W-7<br>(Area - 1.99 acres) |          |      |       |      |        |      |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|--------------|---------------------------------------------------------|----------|------|-------|------|--------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                          | Jan.              | Feb.            | Mar.                                      | Apr.              | May           | June          | July         | Aug.                                                    | Sept.    | Oct. | Nov.  | Dec. | Year   |      |        |      |
| 1956 P                                                                                                                                                                                                                                                                                                                 | 0.13              | 0.10            | 0.56                                      | 0.33              | 1.07          | 2.15          | 2.62         | 2.02                                                    | 0.16     | 0.84 | 0.46  | 1.01 | 11.45  |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                      | 0                 | 0               | 0                                         | 0                 | 0             | T             | T            | .01                                                     | 0        | T    | 0     | 0    | .01    |      |        |      |
| 1957 P                                                                                                                                                                                                                                                                                                                 | .76               | 1.02            | 3.94                                      | 7.14              | 10.85         | 8.13          | 2.24         | .56                                                     | 6.19     | 2.61 | 1.47  | .16  | 45.07  |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                      | 0                 | 0               | .01                                       | 3.40              | 4.92          | 3.45          | 1.18         | 0                                                       | T        | 0    | 0     | 0    | 12.96  |      |        |      |
| 1958 P                                                                                                                                                                                                                                                                                                                 | .67               | .09             | 2.25                                      | 1.79              | 1.66          | 6.18          | 4.15         | 3.39                                                    | 2.80     | .35  | .95   | .26  | 24.54  |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                      | T                 | 0               | T                                         | .04               | 0             | 1.74          | .44          | .01                                                     | .04      | 0    | T     | 0    | 2.27   |      |        |      |
| 1959 P                                                                                                                                                                                                                                                                                                                 | .17               | .12             | 1.94                                      | 2.98              | 6.50          | 1.65          | .51          | 1.64                                                    | 6.40     | 5.09 | .13   | 1.12 | 28.31  |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                      | 0                 | 0               | T                                         | .49               | 1.87          | 0             | 0            | 0                                                       | .10      | 1.63 | 0     | 0    | 4.09   |      |        |      |
| 1960 P                                                                                                                                                                                                                                                                                                                 | 1.17              | 1.61            | .73                                       | .90               | 4.62          | 3.24          | 1/           |                                                         |          |      |       |      | 12.27  |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                      | .07               | .23             | 0                                         | 0                 | 1.27          | .64           | T/           |                                                         |          |      |       |      | 2.21   |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                |                   |                 |                                           |                   |               |               |              | Cherokee, Oklahoma Watershed W-7                        |          |      |       |      |        |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                   | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |              |                                                         |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours      |                                                         | 12 hours |      | 1 day |      | 2 days |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                        | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date         | Vol.                                                    | Date     | Vol. | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                                                                                   | 6-25              | 1.52            | 6-25                                      | 0.77              | 6-25          | 1.18          | 6-25         | 1.20                                                    | 6-24     | 1.74 | 6-24  | 1.74 | 6-24   | 1.74 | 6-16   | 1.74 |
| 1959                                                                                                                                                                                                                                                                                                                   | 5-26              | 2.49            | 5-26                                      | 1.42              | 5-25          | 1.59          | 5-25         | 1.67                                                    | 5-25     | 1.68 | 5-25  | 1.68 | 5-25   | 1.68 | 9-24   | 2.30 |
| 1960                                                                                                                                                                                                                                                                                                                   | 5-28              | 2.41            | 5-28                                      | .84               | 5-28          | 1.26          | 5-28         | 1.26                                                    | 5-28     | 1.26 | 5-28  | 1.26 | 5-28   | 1.26 | 5-28   | 1.27 |
| Notes: Quality of records: P-good, Q-good. 1/ Watershed discontinued July 1, 1960. Watershed Conditions: Continuous wheat 1956-60. Tillage: 1956, 57- chisel 6 inches deep; 1958- 8 foot sweep 4 inches deep; 1959- 8 foot sweep 3 inches deep. All years disc and spring tooth harrows as necessary for weed control. |                   |                 |                                           |                   |               |               |              |                                                         |          |      |       |      |        |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                 |                   |                 |                                           |                   |               |               |              | Cherokee, Oklahoma Watershed W-7                        |          |      |       |      |        |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                  |                   |                 |                                           | Rainfall          |               |               |              | Runoff                                                  |          |      |       |      |        |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                   | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches)                                           |          |      |       |      |        |      |        |      |
| Event of June 24, 1958                                                                                                                                                                                                                                                                                                 |                   |                 |                                           |                   |               |               |              |                                                         |          |      |       |      |        |      |        |      |
| 5-29-58                                                                                                                                                                                                                                                                                                                | 0.71              | 0               | 6-24-58                                   | Raingage          | 9             | 6-24-58       |              |                                                         |          |      |       |      |        |      |        |      |
| 6-16                                                                                                                                                                                                                                                                                                                   | 1.22              | T               | 8:35p                                     | 0                 | 0             | 8:37p         | 0            | 0                                                       |          |      |       |      |        |      |        |      |
| 6-18                                                                                                                                                                                                                                                                                                                   | .08               | 0               | :51                                       | 3.00              | .80           | :43           | .007         | T                                                       |          |      |       |      |        |      |        |      |
| 6-20                                                                                                                                                                                                                                                                                                                   | .58               | 0               | :58                                       | 4.28              | 1.30          | :46           | .027         | T                                                       |          |      |       |      |        |      |        |      |
| 6-21                                                                                                                                                                                                                                                                                                                   | .58               | .002            | 9:01                                      | 4.00              | 1.50          | :49           | .067         | T                                                       |          |      |       |      |        |      |        |      |
| 6-22                                                                                                                                                                                                                                                                                                                   | .05               | 0               | :05                                       | 2.10              | 1.64          | :53           | .251         | .01                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 | :17                                       | .30               | 1.70          | :55           | .458         | .02                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :57           | .797         | .04                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :59           | 1.17         | .08                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | 9:02          | 1.54         | .14                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :04           | 1.69         | .20                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :05           | 1.69         | .23                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :09           | 1.28         | .33                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :14           | .797         | .42                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :19           | .444         | .47                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :25           | .241         | .50                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :39           | .061         | .53                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :47           | .027         | .54                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | 10:09         | .004         | .54                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :18           | .001         | .54                                                     |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :37           | 0            | .54                                                     |          |      |       |      |        |      |        |      |
| Event of May 28, 1960                                                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                                                         |          |      |       |      |        |      |        |      |
| 4-28-60                                                                                                                                                                                                                                                                                                                | 0.01              | 0               | 5-28-60                                   | Raingage          | 9             | 5-28-60       |              |                                                         |          |      |       |      |        |      |        |      |
| 5-3                                                                                                                                                                                                                                                                                                                    | .24               | 0               | 4:47p                                     | 0                 | 0             | 4:54p         | 0            | 0                                                       |          |      |       |      |        |      |        |      |
| 5-4                                                                                                                                                                                                                                                                                                                    | .33               | 0               | :58                                       | .55               | .10           | 5:01          | .004         | T                                                       |          |      |       |      |        |      |        |      |
| 5-5                                                                                                                                                                                                                                                                                                                    | .14               | 0               | 5:03                                      | 1.20              | .20           | :03           | .009         | T                                                       |          |      |       |      |        |      |        |      |
| 5-6                                                                                                                                                                                                                                                                                                                    | .09               | 0               | :07                                       | 1.50              | .30           | :06           | .020         | T                                                       |          |      |       |      |        |      |        |      |
| 5-17                                                                                                                                                                                                                                                                                                                   | .61               | 0               | :10                                       | 2.20              | .41           | :08           | .038         | T                                                       |          |      |       |      |        |      |        |      |
| 5-20                                                                                                                                                                                                                                                                                                                   | .25               | 0               | :16                                       | 3.00              | .71           | :10           | .096         | T                                                       |          |      |       |      |        |      |        |      |
| 5-24                                                                                                                                                                                                                                                                                                                   | .55               | 0               | :19                                       | 2.00              | .81           | :12           | .274         | .01                                                     |          |      |       |      |        |      |        |      |
| 5-28                                                                                                                                                                                                                                                                                                                   | .35               | 0               | :25                                       | 3.10              | 1.12          | :14           | .386         | .02                                                     |          |      |       |      |        |      |        |      |
| Notes: To convert runoff in in/hr to cfs multiply by 2.0066. For map of watershed, see page 34.6-4.                                                                                                                                                                                                                    |                   |                 |                                           |                   |               |               |              |                                                         |          |      |       |      |        |      |        |      |

Cooperative Research Project of USDA and Oklahoma Agricultural Experiment Station

| SELECTED RUNOFF EVENTS                                                                                              |                      |                    |                  |                      | Cherokee, Oklahoma Watershed W-7 |                  |                 |                  |
|---------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|----------------------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                               |                      |                    | Rainfall         |                      |                                  | Runoff           |                 |                  |
| Date                                                                                                                | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches)                 | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of May 28, 1960 - Continued                                                                                   |                      |                    |                  |                      |                                  |                  |                 |                  |
| Watershed Conditions: 100% of<br>area in wheat. Good stand. Wheat<br>in dough stage.                                |                      |                    | 5-28-60          |                      |                                  | 5-28-60          |                 |                  |
|                                                                                                                     |                      |                    | 5:28p            | 1.60                 | 1.20                             | 5:16p            | 0.643           | 0.04             |
|                                                                                                                     |                      |                    | :32              | .60                  | 1.24                             | :19              | 1.07            | .08              |
|                                                                                                                     |                      |                    | :40              | .15                  | 1.26                             | :21              | 1.69            | .12              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :23              | 2.22            | .19              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :26              | 2.41            | .30              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :30              | 2.00            | .46              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :34              | 1.45            | .57              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :38              | .822            | .64              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :44              | .415            | .70              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :48              | .285            | .73              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :54              | .124            | .75              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :58              | .090            | .75              |
|                                                                                                                     |                      |                    |                  |                      |                                  | :59              | .084            | .76              |
|                                                                                                                     |                      |                    |                  |                      |                                  | 6:05             | e .042          | e .76            |
|                                                                                                                     |                      |                    |                  |                      |                                  | :11              | e .022          | e .76            |
|                                                                                                                     |                      |                    |                  |                      |                                  | :18              | e .010          | e .77            |
|                                                                                                                     |                      |                    |                  |                      |                                  | :29              | e .003          | e .77            |
|                                                                                                                     |                      |                    |                  |                      |                                  | :39              | e .001          | e .77            |
|                                                                                                                     |                      |                    |                  |                      |                                  | 7:00             | e 0             | e .77            |
| Notes: To convert runoff in in/hr to cfs multiply by 2.0066. 1/ Beginning of new runoff event. Recession estimated. |                      |                    |                  |                      |                                  |                  |                 |                  |



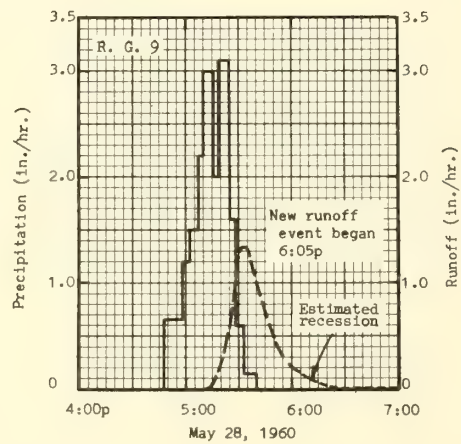
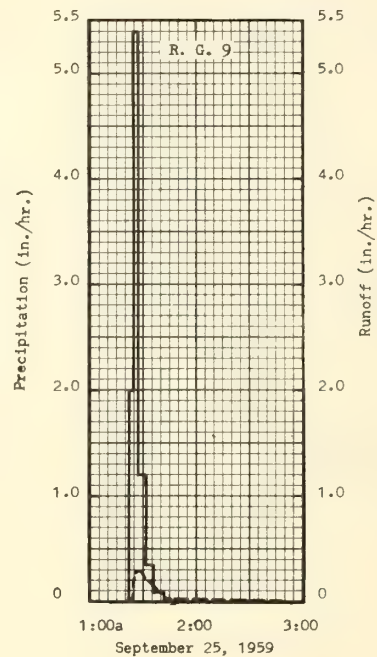
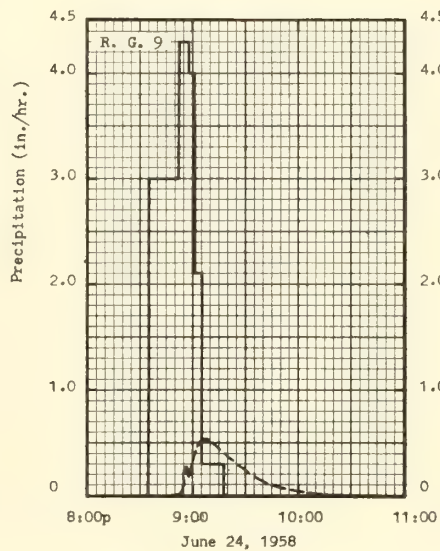


| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |                 |               |              | Cherokee, Oklahoma Watershed W-8<br>(Area - 4.72 acres) |             |              |           |           |                |      |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|-----------------|---------------|--------------|---------------------------------------------------------|-------------|--------------|-----------|-----------|----------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                              | Jan.              | Feb.            | Mar.                                      | Apr.              | May             | June          | July         | Aug.                                                    | Sept.       | Oct.         | Nov.      | Dec.      | Year           |      |        |      |
| 1956<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                             | 0.13              | 0.10            | 0.56                                      | 0.33              | 1.07            | 2.15          | 2.62<br>1/0  | 2.02<br>0                                               | 0.16<br>0   | 0.84<br>0    | 0.46<br>0 | 1.01<br>0 | 11.45<br>0     |      |        |      |
| 1957<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                             | .76<br>0          | 1.02<br>0       | 3.94<br>0                                 | 7.14<br>2.34      | 10.85<br>e 4.12 | 8.13<br>2.64  | 2.24<br>.90  | .56<br>0                                                | 6.19<br>0   | 2.61<br>0    | 1.47<br>0 | .16<br>0  | 45.07<br>10.00 |      |        |      |
| 1958<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                             | .67<br>T          | .09<br>0        | 2.25<br>0                                 | 1.79<br>.01       | 1.66<br>0       | 6.18<br>1.16  | 4.15<br>.14  | 3.39<br>.02                                             | 2.80<br>.02 | .35<br>0     | .95<br>0  | .26<br>0  | 24.54<br>1.35  |      |        |      |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                             | .17<br>0          | .12<br>0        | 1.94<br>0                                 | 2.98<br>.31       | 6.50<br>1.42    | 1.65<br>0     | .57<br>0     | 1.64<br>0                                               | 6.40<br>.30 | 5.09<br>1.03 | .13<br>0  | 1.12<br>0 | 28.31<br>3.06  |      |        |      |
| 1960<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                             | 1.17<br>.04       | 1.61<br>.12     | .73<br>0                                  | .90<br>0          | 4.62<br>.99     | 3.24<br>.44   | 5.52<br>.82  | 2.71<br>0                                               | 2/<br>2/    |              |           |           | 20.50<br>2.41  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                    |                   |                 |                                           |                   |                 |               |              | Cherokee, Oklahoma Watershed W-8                        |             |              |           |           |                |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                       | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |                 |               |              |                                                         |             |              |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 | 1 hour                                    |                   | 2 hours         |               | 6 hours      |                                                         | 12 hours    |              | 1 day     |           | 2 days         |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Date              | Rate            | Date                                      | Vol.              | Date            | Vol.          | Date         | Vol.                                                    | Date        | Vol.         | Date      | Vol.      | Date           | Vol. | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                       | 6-25              | 0.95            | 6-25                                      | 0.49              | 6-25            | 0.69          | 6-25         | 0.86                                                    | 6-24        | 1.16         | 6-24      | 1.16      | 6-24           | 1.16 | 6-24   | 1.16 |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                       | 10-2              | 2.14            | 5-26                                      | 1.18              | 5-26            | 1.31          | 5-25         | 1.38                                                    | 5-25        | 1.38         | 5-25      | 1.38      | 5-25           | 1.38 | 5-22   | 1.38 |
| 1960                                                                                                                                                                                                                                                                                                                                                                                                       | 5-28              | 1.36            | 5-28                                      | .63               | 5-28            | .98           | 5-28         | .99                                                     | 5-28        | .99          | 5-28      | .99       | 5-28           | .99  | 5-28   | .99  |
| Notes: Quality of records: P-good, Q-good. 1/ Station reestablished July 1, 1956. 2/ Watershed discontinued August 31, 1960. Watershed conditions: Continuous wheat 1956-60. Tillage: 1956,57- offset disc plow, chisel 6 inches deep, 8 foot sweep 6 inches deep; 1958- offset disc, chisel 6 inches deep; 1959- 8 foot sweep 3 inches deep. All years spring tooth harrow as necessary for weed control. |                   |                 |                                           |                   |                 |               |              |                                                         |             |              |           |           |                |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |                   |                 |               |              | Cherokee, Oklahoma Watershed W-8                        |             |              |           |           |                |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           | Rainfall          |                 |               |              | Runoff                                                  |             |              |           |           |                |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                       | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches)   | Date and time | Rate (in/hr) | Acc. (inches)                                           |             |              |           |           |                |      |        |      |
| Event of June 24, 1958                                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |                   |                 |               |              |                                                         |             |              |           |           |                |      |        |      |
| 5-29-58                                                                                                                                                                                                                                                                                                                                                                                                    | 0.71              | 0               | 6-24-58                                   | Raingage          | 9               | 6-24-58       |              |                                                         |             |              |           |           |                |      |        |      |
| 6-16                                                                                                                                                                                                                                                                                                                                                                                                       | 1.22              | 0               | 8:35p                                     | 0                 | 0               | 8:47p         | 0            | 0                                                       |             |              |           |           |                |      |        |      |
| 6-18                                                                                                                                                                                                                                                                                                                                                                                                       | .08               | 0               | :51                                       | 3.00              | .80             | :49           | T            | T                                                       |             |              |           |           |                |      |        |      |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                                       | .58               | 0               | :58                                       | 4.28              | 1.30            | :51           | .003         | T                                                       |             |              |           |           |                |      |        |      |
| 6-21                                                                                                                                                                                                                                                                                                                                                                                                       | .58               | 0               | 9:01                                      | 4.00              | 1.50            | :52           | .017         | T                                                       |             |              |           |           |                |      |        |      |
| 6-22                                                                                                                                                                                                                                                                                                                                                                                                       | .05               | 0               | :05                                       | 2.10              | 1.64            | :54           | 1.57         | T                                                       |             |              |           |           |                |      |        |      |
| Watershed Conditions: 100% of area in wheat stubble. Wheat harvested 6-14.                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                           |                   |                 |               |              | :17                                                     | .30         | 1.70         | :56       | .286      | .01            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :57       | .187      | .01            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :58       | .248      | .02            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | 9:02      | .483      | .04            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :04       | .540      | .06            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :08       | .540      | .09            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :11       | .506      | .12            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :17       | .401      | .16            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :27       | .256      | .22            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :35       | .181      | .25            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :50       | .080      | .28            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | 10:10     | .018      | .30            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :21       | .007      | .30            |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 |               |              |                                                         |             |              | :33       | T         | .30            |      |        |      |
| Event of September 25, 1959                                                                                                                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |                 |               |              |                                                         |             |              |           |           |                |      |        |      |
| 8-28-59                                                                                                                                                                                                                                                                                                                                                                                                    | 0.01              | 0               | 9-25-59                                   | Raingage          | 9               | 9-25-59       |              |                                                         |             |              |           |           |                |      |        |      |
| 8-30                                                                                                                                                                                                                                                                                                                                                                                                       | .37               | 0               | 1:22a                                     | 0                 | 0               | 1:22a         | 0            | 0                                                       |             |              |           |           |                |      |        |      |
| 9-3                                                                                                                                                                                                                                                                                                                                                                                                        | .80               | 0               | :25                                       | 2.00              | .10             | :23           | .040         | T                                                       |             |              |           |           |                |      |        |      |
| 9-17                                                                                                                                                                                                                                                                                                                                                                                                       | .13               | 0               | :27                                       | 5.40              | .28             | :24           | .120         | T                                                       |             |              |           |           |                |      |        |      |
| 9-22                                                                                                                                                                                                                                                                                                                                                                                                       | .76               | 0               | :31                                       | 1.20              | .36             | :25           | .220         | T                                                       |             |              |           |           |                |      |        |      |
| 9-23                                                                                                                                                                                                                                                                                                                                                                                                       | .30               | 0               | :36                                       | .36               | .39             | :27           | .302         | .01                                                     |             |              |           |           |                |      |        |      |
| 9-24                                                                                                                                                                                                                                                                                                                                                                                                       | 3.52              | 0               | :42                                       | .10               | .40             | :28           | .302         | .02                                                     |             |              |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 | :31           | .256         | .03                                                     |             |              |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 | :35           | .187         | .05                                                     |             |              |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                 | :41           | .106         | .06                                                     |             |              |           |           |                |      |        |      |
| Notes: To convert runoff in in/hr to cfs multiply by 4.7593                                                                                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |                 |               |              |                                                         |             |              |           |           |                |      |        |      |

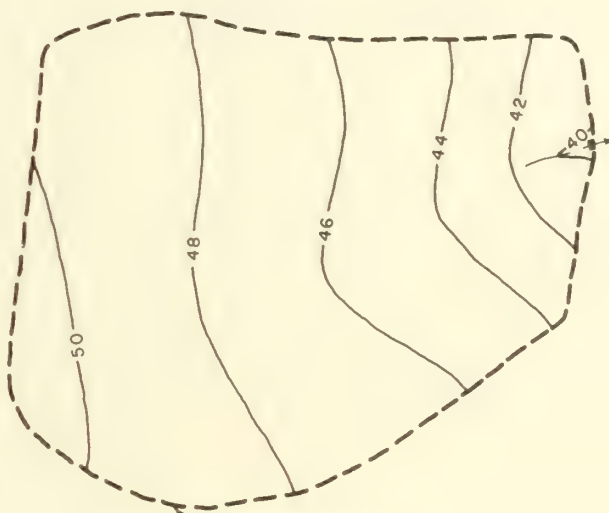
Cooperative Research Project of USDA and Oklahoma Agricultural Experiment Station

| SELECTED RUNOFF EVENTS                                                                          |                      |                    | Cherokee, Oklahoma Watershed W-8        |                      |                  |                  |                 |                  |
|-------------------------------------------------------------------------------------------------|----------------------|--------------------|-----------------------------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                           |                      |                    | Rainfall                                |                      |                  | Runoff           |                 |                  |
| Date                                                                                            | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                        | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
|                                                                                                 |                      |                    | Event of September 25, 1959 - Continued |                      |                  |                  |                 |                  |
| Watershed Conditions: 100% of area fallow. Offset disc tilled 8-21. Spring tooth harrowed 9-10. |                      |                    |                                         |                      |                  | 9-25-59          |                 |                  |
|                                                                                                 |                      |                    |                                         |                      |                  | 1:47a            | 0.066           | 0.07             |
|                                                                                                 |                      |                    |                                         |                      |                  | 2:04             | .018            | .08              |
|                                                                                                 |                      |                    |                                         |                      |                  | :14              | .007            | .08              |
|                                                                                                 |                      |                    |                                         |                      |                  | :22              | .003            | .08              |
|                                                                                                 |                      |                    |                                         |                      |                  | :25              | .002            | .08              |
|                                                                                                 |                      |                    |                                         |                      |                  | :30              | T               | .08              |
|                                                                                                 |                      |                    |                                         |                      |                  | :48              | 0               | .08              |
|                                                                                                 |                      |                    | Event of May 28, 1960                   |                      |                  |                  |                 |                  |
|                                                                                                 |                      |                    |                                         |                      |                  |                  |                 |                  |
| 4-28-60                                                                                         | 0.01                 | 0                  | 5-28-60                                 | Raingage             | 9                | 5-28-60          |                 |                  |
| 5-3                                                                                             | .24                  | 0                  | 4:47p                                   | 0                    | 0                | 5:01p            | 0               | 0                |
| 5-4                                                                                             | .33                  | 0                  | :58                                     | .67                  | .10              | :08              | T               | T                |
| 5-5                                                                                             | .14                  | 0                  | 5:03                                    | 1.20                 | .20              | :11              | T               | T                |
| 5-6                                                                                             | .09                  | 0                  | :07                                     | 1.50                 | .30              | :13              | .004            | T                |
| 5-17                                                                                            | .61                  | 0                  | :10                                     | 2.20                 | .41              | :15              | .038            | T                |
| 5-20                                                                                            | .25                  | 0                  | :16                                     | 3.00                 | .71              | :18              | .157            | .01              |
| 5-24                                                                                            | .55                  | 0                  | :19                                     | 2.00                 | .81              | :20              | .271            | .01              |
| 5-28                                                                                            | .35                  | 0                  | :25                                     | 3.10                 | 1.12             | :22              | .441            | .02              |
|                                                                                                 |                      |                    | :28                                     | 1.60                 | 1.20             | :26              | .756            | .06              |
|                                                                                                 |                      |                    | :32                                     | .60                  | 1.24             | :29              | 1.05            | .11              |
|                                                                                                 |                      |                    | :40                                     | .15                  | 1.26             | :31              | 1.28            | .15              |
| Watershed Conditions: 100% of area in wheat, dough stage. Good stand.                           |                      |                    |                                         |                      |                  | :33              | 1.36            | .19              |
|                                                                                                 |                      |                    |                                         |                      |                  | :36              | 1.30            | .26              |
|                                                                                                 |                      |                    |                                         |                      |                  | :41              | 1.00            | .36              |
|                                                                                                 |                      |                    |                                         |                      |                  | :49              | .540            | .46              |
|                                                                                                 |                      |                    |                                         |                      |                  | :55              | .328            | .50              |
|                                                                                                 |                      |                    |                                         |                      |                  | 6:01             | .206            | .52              |
|                                                                                                 |                      |                    |                                         |                      |                  | :03              | .180            | .53              |
|                                                                                                 |                      |                    |                                         |                      |                  | 1/ :05           | .157            | .54              |
|                                                                                                 |                      |                    |                                         |                      |                  | :14              | e .086          | e .55            |
|                                                                                                 |                      |                    |                                         |                      |                  | :22              | e .042          | e .56            |
|                                                                                                 |                      |                    |                                         |                      |                  | :31              | e .020          | e .57            |
|                                                                                                 |                      |                    |                                         |                      |                  | :40              | e .010          | e .57            |
|                                                                                                 |                      |                    |                                         |                      |                  | :49              | e .005          | e .57            |
|                                                                                                 |                      |                    |                                         |                      |                  | 7:10             | e .001          | e .57            |
|                                                                                                 |                      |                    |                                         |                      |                  | :40              | e 0             | e .57            |

Notes: To convert runoff in in/hr to cfs multiply by 4.7593. 1/ Beginning of new runoff event. Recession estimated.



CHEROKEE, OKLAHOMA Watershed W-8



Gaging Station W-8

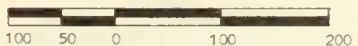
⊙  
R. G. 9

Drainage Area 4.72 acres

LEGEND

- Watershed Boundary
- Natural Waterway
- 44 — Contours
- ⊙ Gaging Station
- ⊙ Recording Rainage

Scale in Feet



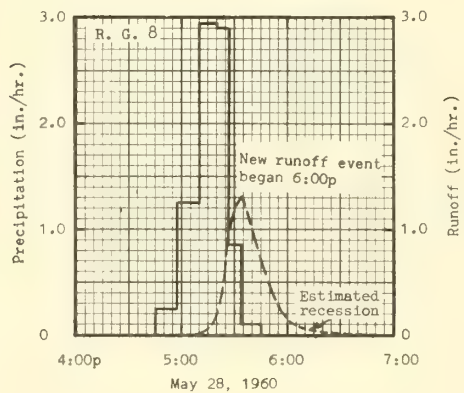
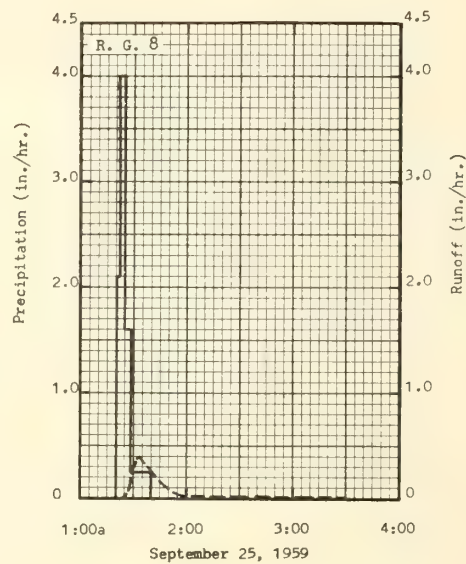
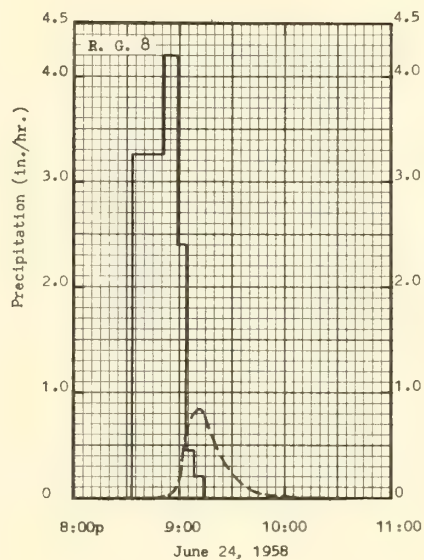
Contour Interval 2 Feet

CHEROKEE, OKLAHOMA  
Watershed W-8



| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |               |                   |               |              |               | Cherokee, Oklahoma Watershed W-9<br>(Area - 8.50 acres) |               |           |           |                |      |        |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|---------------|-------------------|---------------|--------------|---------------|---------------------------------------------------------|---------------|-----------|-----------|----------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                       | Jan.              | Feb.            | Mar.                                      | Apr.          | May               | June          | July         | Aug.          | Sept.                                                   | Oct.          | Nov.      | Dec.      | Year           |      |        |      |
| 1956<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                      | 0.11<br>0         | 0.11<br>0       | 0.53<br>0                                 | 0.29<br>0     | 0.97<br>0         | 2.03<br>0     | 2.48<br>0    | 1.88<br>0     | 0.14<br>0                                               | 0.81<br>0     | 0.44<br>0 | 1.03<br>0 | 10.82<br>0     |      |        |      |
| 1957<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                      | .72<br>0          | 1.02<br>0       | 3.92<br>T                                 | 6.97<br>2.63  | 10.56<br>5.10     | 8.13<br>3.61  | 2.32<br>1.15 | .49<br>0      | 6.05<br>.26                                             | 2.44<br>.02   | 1.52<br>0 | .16<br>0  | 44.30<br>12.77 |      |        |      |
| 1958<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                      | .75<br>0          | .10<br>0        | 2.29<br>0                                 | 1.78<br>.02   | 1.66<br>T         | 6.14<br>1.27  | 4.25<br>.21  | 3.33<br>.01   | 2.55<br>.01                                             | .34<br>0      | .98<br>0  | .35<br>0  | 24.52<br>1.52  |      |        |      |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                      | .19<br>0          | .12<br>0        | 1.95<br>0                                 | 2.96<br>.32   | 6.34<br>1.57      | 1.67<br>0     | .61<br>0     | 1.55<br>0     | 6.02<br>.52                                             | 4.95<br>1.20  | .12<br>0  | 1.18<br>0 | 27.66<br>3.61  |      |        |      |
| 1960<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                      | 1.13<br>.04       | 1.57<br>.11     | .76<br>0                                  | .91<br>0      | 4.47<br>.98       | 3.11<br>.48   | 5.35<br>.30  | 2.63<br>0     | 1/<br>1/                                                |               |           |           | 19.93<br>1.91  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                             |                   |                 |                                           |               |                   |               |              |               | Cherokee, Oklahoma Watershed W-9                        |               |           |           |                |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |               |                   |               |              |               |                                                         |               |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 | 1 hour                                    |               | 2 hours           |               | 6 hours      |               | 12 hours                                                |               | 1 day     |           | 2 days         |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                     | Date              | Rate            | Date                                      | Vol.          | Date              | Vol.          | Date         | Vol.          | Date                                                    | Vol.          | Date      | Vol.      | Date           | Vol. | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                                                                                                                                | 6-25              | 1.04            | 6-25                                      | 0.69          | 6-25              | 0.79          | 6-25         | 0.82          | 6-24                                                    | 1.27          | 6-24      | 1.27      | 6-24           | 1.27 | 6-16   | 1.27 |
| 1959                                                                                                                                                                                                                                                                                                                                                                | 5-26              | 1.96            | 5-26                                      | 1.17          | 5-25              | 1.32          | 5-25         | 1.38          | 5-25                                                    | 1.39          | 5-25      | 1.39      | 5-25           | 1.39 | 9-24   | 1.50 |
| 1960                                                                                                                                                                                                                                                                                                                                                                | 5-28              | 1.31            | 5-28                                      | .58           | 5-28              | .89           | 5-28         | .90           | 5-28                                                    | .90           | 5-28      | .90       | 5-28           | .90  | 5-28   | .90  |
| Notes: Quality of records: P-good, Q-good. 1/ Watershed discontinued August 31, 1960. Watershed Conditions: Continuous wheat 1956-60. Tillage: 1956,57- offset disc plow, chisel 6 inches deep, 8 foot sweep 6 inches deep; 1958- offset disc, chisel 6 inches deep; 1959- 8 foot sweep 3 inches deep. All years spring tooth harrow as necessary for weed control. |                   |                 |                                           |               |                   |               |              |               |                                                         |               |           |           |                |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |               |                   |               |              |               | Cherokee, Oklahoma Watershed W-9                        |               |           |           |                |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                               |                   |                 |                                           | Rainfall      |                   |               |              |               |                                                         | Runoff        |           |           |                |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                | Rainfall (inches) | Runoff (inches) |                                           | Date and time | Intensity (in/hr) | Acc. (inches) |              | Date and time | Rate (in/hr)                                            | Acc. (inches) |           |           |                |      |        |      |
| Event of June 24, 1958                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |               |                   |               |              |               |                                                         |               |           |           |                |      |        |      |
| 5-29-58                                                                                                                                                                                                                                                                                                                                                             | 0.71              | T               |                                           | 6-24-58       | Raingage          | 8             |              | 6-24-58       |                                                         |               |           |           |                |      |        |      |
| 6-16                                                                                                                                                                                                                                                                                                                                                                | 1.20              | .001            |                                           | 8:33p         | 0                 | 0             |              | 8:44p         | 0                                                       | 0             |           |           |                |      |        |      |
| 6-18                                                                                                                                                                                                                                                                                                                                                                | .08               | 0               |                                           | :51           | 3.26              | .98           |              | :53           | .012                                                    | T             |           |           |                |      |        |      |
| 6-20                                                                                                                                                                                                                                                                                                                                                                | .57               | 0               |                                           | :58           | 4.20              | 1.47          |              | :55           | .038                                                    | T             |           |           |                |      |        |      |
| 6-21                                                                                                                                                                                                                                                                                                                                                                | .50               | T               |                                           | 9:03          | 2.40              | 1.67          |              | :57           | .095                                                    | T             |           |           |                |      |        |      |
| 6-22                                                                                                                                                                                                                                                                                                                                                                | .05               | 0               |                                           | :07           | .45               | 1.70          |              | :58           | .125                                                    | .01           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           | :13           | .20               | 1.72          |              | 9:00          | .204                                                    | .01           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :01           | .320                                                    | .01           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :03           | .489                                                    | .03           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :05           | .650                                                    | .05           |           |           |                |      |        |      |
| Watershed Conditions: 100% of area in wheat stubble. Wheat harvested 6-14.                                                                                                                                                                                                                                                                                          |                   |                 |                                           |               |                   |               |              |               |                                                         |               |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :07           | .756                                                    | .07           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :09           | .836                                                    | .10           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :10           | .848                                                    | .11           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :11           | .860                                                    | .12           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :12           | .848                                                    | .14           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :14           | .790                                                    | .17           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :16           | .734                                                    | .19           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :20           | .552                                                    | .24           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :24           | .369                                                    | .27           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :28           | .267                                                    | .29           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :32           | .189                                                    | .30           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :37           | .130                                                    | .32           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :43           | .075                                                    | .32           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :52           | .036                                                    | .33           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | 10:02         | .018                                                    | .34           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | :22           | .004                                                    | .34           |           |           |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |              | 11:06         | 0                                                       | .34           |           |           |                |      |        |      |
| Notes: To convert runoff in in/hr to cfs multiply by 8.5809. For map of watershed refer to Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS, SWC, January 1960, page 34.9-4.                                                                                                                                                      |                   |                 |                                           |               |                   |               |              |               |                                                         |               |           |           |                |      |        |      |

| SELECTED RUNOFF EVENTS                                                                                       |                      |                    |                  |                      |                  | Cherokee, Oklahoma Watershed W-9 |                 |                  |
|--------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                        |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                         | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of September 25, 1959                                                                                  |                      |                    |                  |                      |                  |                                  |                 |                  |
| 8-28-59                                                                                                      | 0.01                 | 0                  | 9-25-59          | Raingage             | 8                | 9-25-59                          |                 |                  |
| 8-30                                                                                                         | .35                  | 0                  | 1:20a            | 0                    | 0                | 1:18a                            | 0               | 0                |
| 9-3                                                                                                          | .81                  | 0                  | :22              | 2.10                 | .07              | :20                              | T               | T                |
| 9-17                                                                                                         | .11                  | 0                  | :25              | 4.00                 | .27              | :22                              | .009            | T                |
| 9-22                                                                                                         | .66                  | 0                  | :28              | 1.60                 | .35              | :23                              | .014            | T                |
| 9-23                                                                                                         | .27                  | 0                  | :40              | .25                  | .40              | :25                              | .030            | T                |
| 9-24                                                                                                         | 3.33                 | .352               |                  |                      |                  | :26                              | .050            | T                |
| Watershed Conditions: 100% of area<br>fallow. Offset disc plowed 8-24,<br>Spring tooth harrowed 9-10.        |                      |                    |                  |                      |                  | :28                              | .130            | T                |
|                                                                                                              |                      |                    |                  |                      |                  | :31                              | .326            | .02              |
|                                                                                                              |                      |                    |                  |                      |                  | :33                              | .407            | .03              |
|                                                                                                              |                      |                    |                  |                      |                  | :35                              | .384            | .04              |
|                                                                                                              |                      |                    |                  |                      |                  | :38                              | .326            | .06              |
|                                                                                                              |                      |                    |                  |                      |                  | :46                              | .138            | .09              |
|                                                                                                              |                      |                    |                  |                      |                  | :52                              | .072            | .10              |
|                                                                                                              |                      |                    |                  |                      |                  | 2:00                             | .036            | .11              |
|                                                                                                              |                      |                    |                  |                      |                  | :10                              | .021            | .11              |
|                                                                                                              |                      |                    |                  |                      |                  | :26                              | .014            | .12              |
|                                                                                                              |                      |                    |                  |                      |                  | :40                              | .008            | .12              |
|                                                                                                              |                      |                    |                  |                      |                  | :54                              | .003            | .12              |
|                                                                                                              |                      |                    |                  |                      |                  | 3:00                             | .002            | .12              |
|                                                                                                              |                      |                    |                  |                      |                  | :16                              | .001            | .12              |
|                                                                                                              |                      |                    |                  |                      |                  | :24                              | T               | .12              |
| Event of May 28, 1960                                                                                        |                      |                    |                  |                      |                  |                                  |                 |                  |
| 4-28-60                                                                                                      | 0.01                 | 0                  | 5-28-60          | Raingage             | 8                | 5-28-60                          |                 |                  |
| 5-3                                                                                                          | .23                  | 0                  | 4:45p            | 0                    | 0                | 5:06p                            | 0               | 0                |
| 5-4                                                                                                          | .32                  | 0                  | :57              | .25                  | .05              | :07                              | T               | T                |
| 5-5                                                                                                          | .14                  | 0                  | 5:10             | 1.25                 | .32              | :09                              | .001            | T                |
| 5-6                                                                                                          | .11                  | 0                  | :20              | 2.94                 | .81              | :13                              | .009            | T                |
| 5-17                                                                                                         | .59                  | 0                  | :26              | 2.90                 | 1.10             | :18                              | .113            | T                |
| 5-19                                                                                                         | .25                  | 0                  | :33              | .86                  | 1.20             | :20                              | .250            | .01              |
| 5-24                                                                                                         | .55                  | 0                  | :45              | .10                  | 1.22             | :22                              | .355            | .02              |
| 5-28                                                                                                         | .35                  | 0                  |                  |                      |                  | :24                              | .650            | .04              |
| Watershed Conditions: 100% of area<br>wheat in tough stage. Good stand.                                      |                      |                    |                  |                      |                  | :26                              | .873            | .06              |
|                                                                                                              |                      |                    |                  |                      |                  | :29                              | 1.15            | .11              |
|                                                                                                              |                      |                    |                  |                      |                  | :32                              | 1.26            | .16              |
|                                                                                                              |                      |                    |                  |                      |                  | :34                              | 1.31            | .22              |
|                                                                                                              |                      |                    |                  |                      |                  | :36                              | 1.26            | .26              |
|                                                                                                              |                      |                    |                  |                      |                  | :42                              | .947            | .38              |
|                                                                                                              |                      |                    |                  |                      |                  | :46                              | .650            | .43              |
|                                                                                                              |                      |                    |                  |                      |                  | :52                              | .384            | .48              |
|                                                                                                              |                      |                    |                  |                      |                  | :56                              | .238            | .50              |
|                                                                                                              |                      |                    |                  |                      |                  | 1/ 6:00                          | .155            | .51              |
|                                                                                                              |                      |                    |                  |                      |                  | :07                              | e .080          | e .53            |
|                                                                                                              |                      |                    |                  |                      |                  | :14                              | e .038          | e .53            |
|                                                                                                              |                      |                    |                  |                      |                  | :21                              | e .019          | e .54            |
|                                                                                                              |                      |                    |                  |                      |                  | :30                              | e .008          | e .54            |
|                                                                                                              |                      |                    |                  |                      |                  | :37                              | e .004          | e .54            |
|                                                                                                              |                      |                    |                  |                      |                  | :44                              | e .002          | e .54            |
|                                                                                                              |                      |                    |                  |                      |                  | :51                              | e .001          | e .54            |
|                                                                                                              |                      |                    |                  |                      |                  | 7:14                             | e 0             | e .54            |
| Notes: To convert runoff in in/hr to cfs multiply by 8.5809. 1/ New runoff event began. Recession estimated. |                      |                    |                  |                      |                  |                                  |                 |                  |



CHEROKEE, OKLAHOMA Watershed W-9

| MONTHLY PRECIPITATION AND RUNOFF (Inches) |      |      |      |      |      |       |       | Stillwater, Oklahoma Watershed W-1<br>(Area - 16.7 acres) |       |       |      |      |       |
|-------------------------------------------|------|------|------|------|------|-------|-------|-----------------------------------------------------------|-------|-------|------|------|-------|
| Month<br>Year                             | Jan. | Feb. | Mar. | Apr. | May  | June  | July  | Aug.                                                      | Sept. | Oct.  | Nov. | Dec. | Year  |
| 1954                                      | 0.50 | 0.1  | 0.52 | 1.1  | 0.28 | 1.98  | 2.32  | 0.73                                                      | 0.15  | 1.52  | 1.55 | 1.48 | 16.06 |
| 1955                                      | .60  | 1.2  | 0.3  | 8.11 | 0.2  | 11.30 | 1.60  | 1.02                                                      | 1.1   | 1.2   | 0.10 | .66  | 15.9  |
| 1956                                      | 1.13 | 1.05 | 0.3  | 1.50 | 1.71 | 2.3   | 2.3   | 2.3                                                       | 2.30  | .20   | .7   | .79  | 28.35 |
| 1957                                      | .07  | .15  | 0.3  | 0.3  | 0    | 0     | .07   | 0                                                         | .02   | 0     | 0    | 0    | 4.17  |
| 1958                                      | 0.27 | 0.3  | 1.33 | 0.3  | 0.3  | 3.76  | 10.47 | 2.41                                                      | 0.4   | 10.00 | .15  | 1.7  | 18.20 |
| 1959                                      | 0    | 0    | .16  | 0.3  | 1.3  | .01   | 2.3   | 0                                                         | 1.82  | 7.85  | 0    | .4   | 16.08 |

| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS |                   |      |                                           |      |         |      |         |      |          | Stillwater, Oklahoma Watershed W-1 |       |      |        |      |        |      |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|----------|------------------------------------|-------|------|--------|------|--------|------|--|
| YEAR                                                                                                                    | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |          |                                    |       |      |        |      |        |      |  |
|                                                                                                                         |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours |                                    | 1 day |      | 2 days |      | 8 days |      |  |
|                                                                                                                         | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date     | Vol.                               | Date  | Vol. | Date   | Vol. | Date   | Vol. |  |
| 1957                                                                                                                    | 1-1               | 1.51 | 1-1                                       | 0.51 | 1-1     | 1.51 | 1-1     | 1.51 | 1-1      | 1.51                               | 1-1   | 1.51 | 1-1    | 1.51 | 1-18   | 4.95 |  |
| 1958                                                                                                                    | 2-1               | 1.51 | 2-1                                       | 1.51 | 2-1     | 1.51 | 2-1     | 1.51 | 2-1      | 1.51                               | 2-1   | 1.51 | 2-1    | 1.51 | 2-18   | 4.95 |  |
| 1959                                                                                                                    | 10-1              | 1.51 | 10-2                                      | 1.51 | 10-2    | 1.51 | 10-2    | 1.51 | 10-2     | 1.51                               | 10-1  | 1.51 | 10-1   | 1.51 | 10-18  | 4.95 |  |

Notes: . Quality of records: Precipitation and Runoff, good.  
Watershed Conditions: 1956 - poor cover; 1957-1959 - good to excellent cover.

| SELECTED RUNOFF EVENTS |                                    |                    | Stillwater, Oklahoma |                      |                  | Watershed W-1    |                 |                  |
|------------------------|------------------------------------|--------------------|----------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions  |                                    |                    | Rainfall             |                      |                  | Runoff           |                 |                  |
| Date                   | Rainfall <sup>2/</sup><br>(inches) | Runoff<br>(inches) | Date and<br>time     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| EVENT OF APRIL 1, 1967 |                                    |                    |                      |                      |                  |                  |                 |                  |
| 3-20-57                | .61                                | 0                  | 4-1-57               | 0.00                 | 0.00             | 4-16-57          | 0.00            | 0                |
| 3-23                   | .50                                | 0                  | 4-2-57               | 0.00                 | 0.00             | 4-17-57          | 0.00            | 0                |
| 3-26                   | .05                                | 0                  | 4-3-57               | 0.00                 | 0.00             | 4-18-57          | 0.00            | .001             |
| 3-30                   | .45                                | 0                  | 4-4-57               | 0.00                 | 0.00             | 4-19-57          | 0.00            | .0060            |
| 4-3                    | .93                                | .254               | 4-5-57               | 0.00                 | .12              | 4-20-57          | .12             | .06              |
| 4-4                    | 0                                  | .032               | 4-6-57               | 0.00                 | .12              | 4-21-57          | .12             | .06              |
| 4-7                    | .27                                | 0                  | 4-7-57               | .12                  | .12              | 4-22-57          | .12             | .14              |
| 4-12                   | .16                                | 0                  | 4-8-57               | .12                  | .12              | 4-23-57          | .24             | .039             |
|                        |                                    |                    | 4-9-57               | .12                  | .12              | 4-24-57          | .12             | .04              |
|                        |                                    |                    | 4-10-57              | .12                  | .12              | 4-25-57          | .12             | .139             |
|                        |                                    |                    | 4-11-57              | .12                  | .12              | 4-26-57          | 1.25            | .14              |
|                        |                                    |                    | 4-12-57              | .12                  | .12              | 4-27-57          | 2.10            | .14              |
|                        |                                    |                    | 4-13-57              | .12                  | .12              | 4-28-57          | 0.05            | .08              |
|                        |                                    |                    | 4-14-57              | .00                  | .00              | 4-29-57          | 4.15            | 1.157            |
|                        |                                    |                    | 4-15-57              | .00                  | .00              | 4-30-57          | 0.05            | 1.14             |
|                        |                                    |                    | 4-16-57              | .00                  | .00              | 5-1-57           | 0.00            | .00              |
|                        |                                    |                    | 4-17-57              | .12                  | .54              | 5-2-57           | 0.00            | .00              |
|                        |                                    |                    | 4-18-57              | .12                  | .54              | 5-3-57           | 0.00            | .00              |
|                        |                                    |                    | 4-19-57              | .12                  | .54              | 5-4-57           | 0.00            | .00              |
|                        |                                    |                    | 4-20-57              | .12                  | .54              | 5-5-57           | 1.55            | 0.00             |
|                        |                                    |                    | 4-21-57              | .12                  | .54              | 5-6-57           | 1.00            | 0.00             |
|                        |                                    |                    | 4-22-57              | .12                  | .54              | 5-7-57           | 0.00            | .00              |
|                        |                                    |                    | 4-23-57              | .12                  | .54              | 5-8-57           | 0.00            | .00              |
|                        |                                    |                    | 4-24-57              | .12                  | .54              | 5-9-57           | 0.00            | .00              |
|                        |                                    |                    | 4-25-57              | .12                  | .54              | 5-10-57          | 0.00            | .00              |
|                        |                                    |                    | 4-26-57              | .12                  | .54              | 5-11-57          | 0.00            | .00              |
|                        |                                    |                    | 4-27-57              | .12                  | .54              | 5-12-57          | 0.00            | .00              |
|                        |                                    |                    | 4-28-57              | .12                  | .54              | 5-13-57          | 0.00            | .00              |
|                        |                                    |                    | 4-29-57              | .12                  | .54              | 5-14-57          | 0.00            | .00              |
|                        |                                    |                    | 4-30-57              | .12                  | .54              | 5-15-57          | 0.00            | .00              |
|                        |                                    |                    | 5-1-57               | .12                  | .54              | 5-16-57          | 0.00            | .00              |
|                        |                                    |                    | 5-2-57               | .12                  | .54              | 5-17-57          | 0.00            | .00              |
|                        |                                    |                    | 5-3-57               | .12                  | .54              | 5-18-57          | 0.00            | .00              |
|                        |                                    |                    | 5-4-57               | .12                  | .54              | 5-19-57          | 0.00            | .00              |
|                        |                                    |                    | 5-5-57               | .12                  | .54              | 5-20-57          | 0.00            | .00              |
|                        |                                    |                    | 5-6-57               | .12                  | .54              | 5-21-57          | 0.00            | .00              |
|                        |                                    |                    | 5-7-57               | .12                  | .54              | 5-22-57          | 0.00            | .00              |
|                        |                                    |                    | 5-8-57               | .12                  | .54              | 5-23-57          | 0.00            | .00              |
|                        |                                    |                    | 5-9-57               | .12                  | .54              | 5-24-57          | 0.00            | .00              |
|                        |                                    |                    | 5-10-57              | .12                  | .54              | 5-25-57          | 0.00            | .00              |
|                        |                                    |                    | 5-11-57              | .12                  | .54              | 5-26-57          | 0.00            | .00              |
|                        |                                    |                    | 5-12-57              | .12                  | .54              | 5-27-57          | 0.00            | .00              |
|                        |                                    |                    | 5-13-57              | .12                  | .54              | 5-28-57          | 0.00            | .00              |
|                        |                                    |                    | 5-14-57              | .12                  | .54              | 5-29-57          | 0.00            | .00              |
|                        |                                    |                    | 5-15-57              | .12                  | .54              | 5-30-57          | 0.00            | .00              |
|                        |                                    |                    | 5-16-57              | .12                  | .54              | 5-31-57          | 0               |                  |

Notes: 16.839 .  
2/ All antecedent rainfall measured using Raingage R-3.

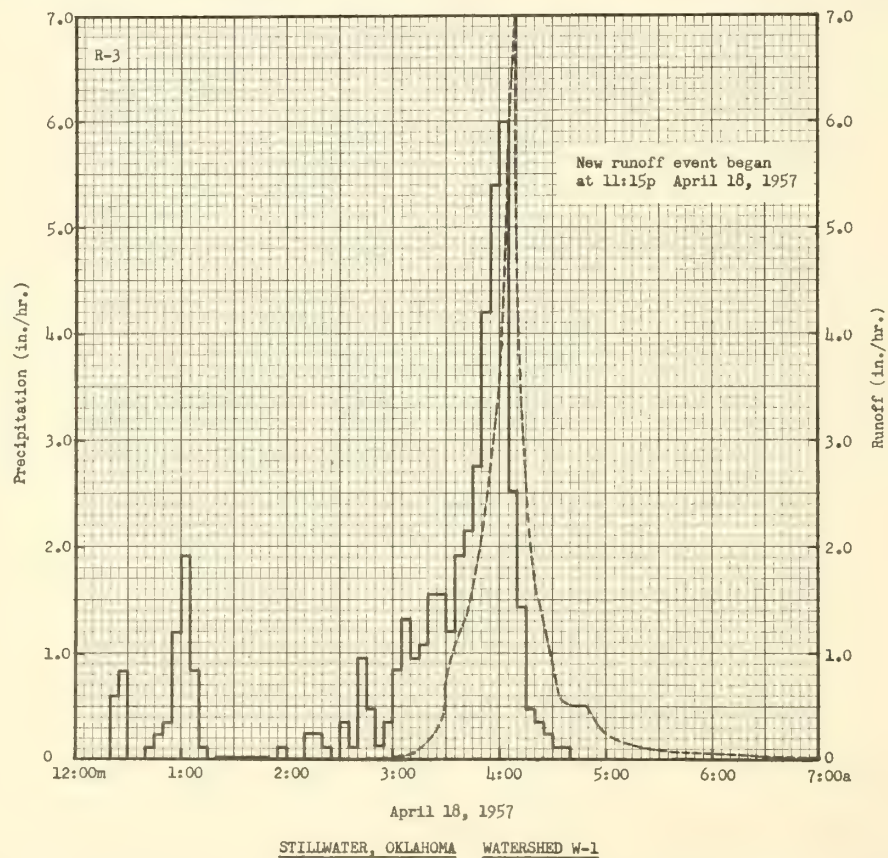


| SELECTED RUNOFF EVENTS                     |                   |                 |               |                   |               | Stillwater, Oklahoma Watershed W-1 |                     |               |
|--------------------------------------------|-------------------|-----------------|---------------|-------------------|---------------|------------------------------------|---------------------|---------------|
| Antecedent conditions                      |                   |                 | Rainfall      |                   |               | Runoff                             |                     |               |
| Date                                       | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                      | Rate (in/hr)        | Acc. (inches) |
| <u>Event of April 18, 1957 - Continued</u> |                   |                 |               |                   |               |                                    |                     |               |
|                                            |                   |                 | 5:15a         | .96               | 1.05          | 8:48a                              | .0066               | 3.039         |
|                                            |                   |                 | :20           | 1.08              | 1.11          | 10:30                              | .0032               | 3.047         |
|                                            |                   |                 | :25           | 1.56              | 1.27          | 12:00n                             | .0022               | 3.051         |
|                                            |                   |                 | :30           | 1.56              | 1.40          | 11:15p <sup>1/</sup>               | .0004 <sup>1/</sup> | 3.065         |
|                                            |                   |                 | :35           | 1.20              | 1.50          |                                    |                     |               |
|                                            |                   |                 | 4:0           | 1.92              | 1.66          |                                    |                     |               |
|                                            |                   |                 | 4:5           | 2.16              | 1.81          |                                    |                     |               |
|                                            |                   |                 | :50           | 2.76              | 2.07          |                                    |                     |               |
|                                            |                   |                 | :55           | 4.20              | 2.42          |                                    |                     |               |
|                                            |                   |                 | 4:00          | 5.40              | 2.97          |                                    |                     |               |
|                                            |                   |                 | :05           | 6.00              | 3.47          |                                    |                     |               |
|                                            |                   |                 | :10           | 2.52              | 3.68          |                                    |                     |               |
|                                            |                   |                 | :15           | 1.44              | 3.80          |                                    |                     |               |
|                                            |                   |                 | :20           | .48               | 3.81          |                                    |                     |               |
|                                            |                   |                 | :25           | .36               | 3.87          |                                    |                     |               |
|                                            |                   |                 | :30           | .24               | 3.89          |                                    |                     |               |
|                                            |                   |                 | 4:0           | .12               | 3.91          |                                    |                     |               |
| <u>Event of June 27 and 28, 1957</u>       |                   |                 |               |                   |               |                                    |                     |               |
| 5-30-57                                    | .89               | .103            | 6-27-57       | Rainage           | R-3           | 6-27-57                            |                     |               |
| 5-31                                       | .37               | 0               | 10:32p        | 0                 | 0             | 10:42p                             | 0                   | 0             |
| 6-1                                        | .05               | 0               | :37           | 1.68              | .11           | 4:6                                | .0066               | 0             |
| 6-2                                        | .73               | .398            | 4:2           | 6.12              | .65           | 4:7                                | .0167               | 0             |
| 6-3                                        | .20               | .117            | 4:7           | 3.36              | .93           | 4:8                                | .0375               | .001          |
| 6-4                                        | .16               | .133            | :52           | .84               | 1.00          | 4:9                                | .0774               | .002          |
| 6-9                                        | .57               | .185            | :57           | .12               | 1.01          | :50                                | .123                | .004          |
| 6-10                                       | 1.30              | .878            |               |                   |               | :52                                | .250                | .010          |
| 6-12                                       | .58               | .201            |               |                   |               | 5:4                                | 1.030               | .031          |
| 6-17                                       | .86               | .009            |               |                   |               | :55                                | 1.652               | .054          |
| 6-18                                       | 2.32              | 1.804           |               |                   |               | :56                                | 2.28                | .056          |
| 6-22                                       | .50               | 0               |               |                   |               | :58                                | 2.46                | .166          |
| 6-23                                       | 2.42              | 1.653           |               |                   |               | 11:00                              | 1.46                | .231          |
| 6-26                                       | .52               | 0               |               |                   |               | :06                                | .780                | .213          |
|                                            |                   |                 |               |                   |               | :12                                | .520                | .408          |
|                                            |                   |                 |               |                   |               | :20                                | .433                | .472          |
|                                            |                   |                 |               |                   |               | :32                                | .238                | .539          |
|                                            |                   |                 |               |                   |               | 12:00m                             | .0975               | .613          |
|                                            |                   |                 |               |                   |               | 6-28-57                            |                     |               |
|                                            |                   |                 |               |                   |               | 12:22a                             | .0452               | .641          |
|                                            |                   |                 |               |                   |               | 4:8                                | .0214               | .655          |
|                                            |                   |                 |               |                   |               | 1:06                               | .0122               | .660          |
|                                            |                   |                 |               |                   |               | :39                                | .0060               | .665          |
|                                            |                   |                 |               |                   |               | 2:08                               | .0036               | .667          |
|                                            |                   |                 |               |                   |               | 4:40                               | 0                   | .672          |
| <u>Event of October 1 and 2, 1959</u>      |                   |                 |               |                   |               |                                    |                     |               |
| 9-1-59                                     | 1.33              | .040            | 10-1-59       | Rainage           | R-3           | 10-1-59                            |                     |               |
| 9-2                                        | 0                 | .012            | 9:35p         | 0                 | 0             | 10:22p                             | .0097               | 0             |
| 9-3                                        | .39               | .012            | :55           | .12               | .04           | 12:00m                             | .0358               | .054          |
| 9-4                                        | 0                 | .010            | 10:00         | .24               | .06           | 10-2-59                            |                     |               |
| 9-5                                        | 0                 | .010            | :10           | .24               | .10           | 1:56a                              | .0512               | .122          |
| 9-6                                        | 0                 | .009            | :20           | .24               | .11           | 2:09                               | .117                | .139          |
| 9-7                                        | 0                 | .007            | :30           | .06               | .15           | :30                                | .184                | .194          |
| 9-17                                       | .08               | 0               | :35           | .12               | .16           | :51                                | .410                | .278          |
| 9-23                                       | .49               | 0               | ceased        |                   |               | 3:00                               | .872                | .379          |
| 9-24                                       | 1.42              | .517            | 11:35         | 0                 | .16           | :08                                | 1.084               | .511          |
| 9-25                                       | 3.70              | 1.016           | 10-2-59       |                   |               | :17                                | .970                | .667          |
| 9-26                                       | 0                 | .018            | 12:05a        | .08               | .20           | :29                                | .606                | .833          |
| 9-27                                       | 0                 | .011            | :40           | 0                 | .20           | :40                                | .524                | .937          |
| 9-28                                       | 0                 | .010            | 1:05          | .06               | .23           | :50                                | .676                | 1.034         |
| 9-29                                       | .32               | .009            | :35           | .12               | .29           | :54                                | 1.046               | 1.088         |
| Notes:                                     |                   |                 |               |                   |               |                                    |                     |               |
| 1/ Beginning of new runoff event.          |                   |                 |               |                   |               |                                    |                     |               |

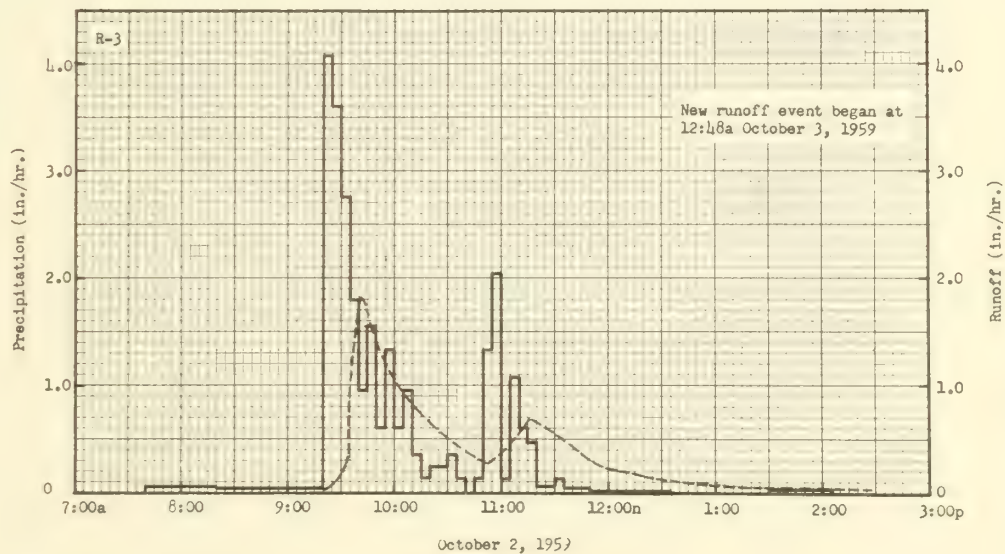
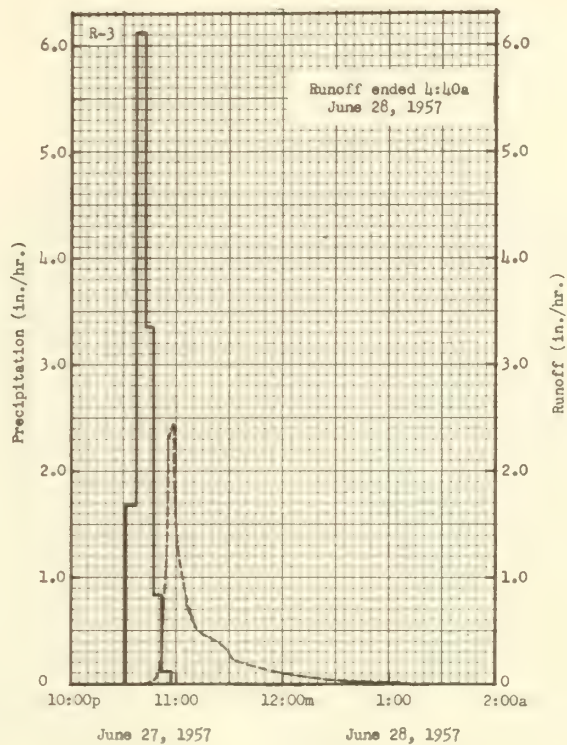
| SELECTED RUNOFF EVENTS                                                                                                                                |                      |                    |                  |                      |                  | Stillwater, Oklahoma Watershed W-1 |                     |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|------------------------------------|---------------------|------------------|
| Antecedent conditions                                                                                                                                 |                      |                    | Rainfall         |                      |                  | Runoff                             |                     |                  |
| Date                                                                                                                                                  | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr)     | Acc.<br>(inches) |
| <u>Event of October 1 and 2, 1959 Cont'd.</u>                                                                                                         |                      |                    |                  |                      |                  |                                    |                     |                  |
| 9-30-59                                                                                                                                               | .51                  | .135               | 1:50a            | .20                  | .34              | 3:57a                              | 1.979               | 1.161            |
| 10-1                                                                                                                                                  | .74 <sup>1/2</sup>   | .591               | :55              | .04                  | .35              | :58                                | 2.256               | 1.196            |
|                                                                                                                                                       |                      |                    | 2:00             | 1.44                 | .47              | 4:04                               | 2.669               | 1.442            |
|                                                                                                                                                       |                      |                    | :05              | .36                  | .50              | :10                                | 2.130               | 1.685            |
|                                                                                                                                                       |                      |                    | :20              | .12                  | .53              | :16                                | 1.363               | 1.862            |
|                                                                                                                                                       |                      |                    | :25              | .12                  | .54              | :20                                | .962                | 1.940            |
|                                                                                                                                                       |                      |                    | :30              | .36                  | .57              | :25                                | .584                | 2.006            |
|                                                                                                                                                       |                      |                    | :35              | .60                  | .62              | :28                                | .730                | 2.039            |
|                                                                                                                                                       |                      |                    | :40              | 1.56                 | .75              | :30                                | .675                | 2.063            |
|                                                                                                                                                       |                      |                    | :45              | 2.16                 | .93              | :46                                | .503                | 2.212            |
|                                                                                                                                                       |                      |                    | :50              | 1.20                 | 1.03             | 5:10                               | .410                | 2.400            |
|                                                                                                                                                       |                      |                    | :55              | .96                  | 1.11             | :41                                | .238                | 2.559            |
|                                                                                                                                                       |                      |                    | 3:00             | .96                  | 1.19             | 6:37                               | .0964               | 2.707            |
|                                                                                                                                                       |                      |                    | :05              | 1.32                 | 1.30             | 9:16                               | .0155 <sup>2</sup>  | 2.810            |
|                                                                                                                                                       |                      |                    | :10              | .96                  | 1.38             | 1:12 <sup>2/</sup>                 | .0155 <sup>2/</sup> | 2.810            |
|                                                                                                                                                       |                      |                    | :15              | .48                  | 1.42             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :20              | .24                  | 1.44             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :25              | .36                  | 1.47             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :30              | .24                  | 1.49             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :35              | .60                  | 1.54             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :40              | .96                  | 1.62             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :45              | 2.04                 | 1.79             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :50              | 1.20                 | 1.89             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :55              | 5.28                 | 2.33             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | 4:00             | 2.04                 | 2.50             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :05              | .96                  | 2.58             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :10              | .72                  | 2.64             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :15              | .24                  | 2.66             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :20              | .48                  | 2.70             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :25              | .48                  | 2.74             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :30              | .24                  | 2.76             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :35              | .24                  | 2.78             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :40              | .72                  | 2.84             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :45              | .96                  | 2.93             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :50              | .36                  | 2.96             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :55              | .24                  | 2.98             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | 5:00             | .12                  | 2.99             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :05              | .12                  | 3.00             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :15              | 0                    | 3.00             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :20              | 1.08                 | 3.09             |                                    |                     |                  |
|                                                                                                                                                       |                      |                    | :25              | .24                  | 3.11             |                                    |                     |                  |
| <u>Event of October 2 and 3, 1959</u>                                                                                                                 |                      |                    |                  |                      |                  |                                    |                     |                  |
| 9-1-59                                                                                                                                                | 1.33                 | .040               | 10-2-59          | Raingage             | R-3              | 10-2-59                            |                     |                  |
| 9-2                                                                                                                                                   | 0                    | .012               | 7:40a            | 0                    | 0                | 9:19a                              | .0155               | 0                |
| 9-3                                                                                                                                                   | .39                  | .012               | 8:20             | .03                  | .02              | :26                                | .0637               | .003             |
| 9-4                                                                                                                                                   | 0                    | .010               | 9:20             | .02                  | .04              | :30                                | .168                | .010             |
| 9-5                                                                                                                                                   | 0                    | .010               | :25              | 4.08                 | .38              | :34                                | .347                | .026             |
| 9-6                                                                                                                                                   | 0                    | .009               | :30              | 3.60                 | .68              | :37                                | 1.26                | .063             |
| 9-7                                                                                                                                                   | 0                    | .007               | :35              | 2.76                 | .71              | :40                                | 1.76                | .142             |
| 9-17                                                                                                                                                  | .08                  | 0                  | :40              | 1.80                 | 1.06             | :42                                | 1.82                | .202             |
| 9-23                                                                                                                                                  | .49                  | 0                  | :45              | .96                  | 1.14             | :46                                | 1.66                | .316             |
| 9-24                                                                                                                                                  | 1.42                 | .517               | :50              | 1.56                 | 1.27             | :51                                | 1.41                | .444             |
| 9-25                                                                                                                                                  | 3.70                 | 1.016              | :55              | .60                  | 1.32             | 10:00                              | 1.02                | .623             |
| 9-26                                                                                                                                                  | 0                    | .018               | 10:00            | 1.32                 | 1.43             | :06                                | .904                | .719             |
| 9-27                                                                                                                                                  | 0                    | .011               | :05              | .60                  | 1.48             | :12                                | .811                | .805             |
| 9-28                                                                                                                                                  | 0                    | .010               | :10              | .96                  | 1.56             | :18                                | .685                | .879             |
| 9-29                                                                                                                                                  | .32                  | .009               | :15              | .36                  | 1.59             | :25                                | .557                | .952             |
| 9-30                                                                                                                                                  | .51                  | .135               | :20              | .12                  | 1.60             | :33                                | .478                | 1.020            |
| 10-1                                                                                                                                                  | 1.14 <sup>3</sup>    | .645               | :25              | .24                  | 1.62             | :43                                | .362                | 1.090            |
| 10-2                                                                                                                                                  | 2.91 <sup>2/</sup>   | 2.756              | :30              | .24                  | 1.64             | :50                                | .299                | 1.129            |
|                                                                                                                                                       |                      |                    | :35              | .36                  | 1.67             | :53                                | .283                | 1.143            |
|                                                                                                                                                       |                      |                    | :40              | .12                  | 1.68             | :56                                | .299                | 1.158            |
| Notes: To convert runoff in in/hr to cfs, multiply by 16.839 . 1/ Rainfall 5:45a to 5:20p. 2/ Beginning of new event.<br>3/ Rainfall 12:01a to 5:25a. |                      |                    |                  |                      |                  |                                    |                     |                  |

| SELECTED RUNOFF EVENTS                                                                                                            |                   |                 | Stillwater, Oklahoma Watershed W-1 |                   |               |               |              |               |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|------------------------------------|-------------------|---------------|---------------|--------------|---------------|
| Antecedent conditions                                                                                                             |                   |                 | Rainfall                           |                   |               | Runoff        |              |               |
| Date                                                                                                                              | Rainfall (inches) | Runoff (inches) | Date and time                      | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches) |
| Event of October 2 and 3, 1959 - Continued                                                                                        |                   |                 |                                    |                   |               |               |              |               |
| Watershed Conditions: All of the area was in native grass pasture lightly to moderately grazed, generally in very good condition. |                   |                 | 10:45a                             | 0                 | 1.58          | 11:03a        | .410         | 1.199         |
|                                                                                                                                   |                   |                 | :50                                | .12               | 1.69          | :11           | .566         | 1.262         |
|                                                                                                                                   |                   |                 | :55                                | 1.32              | 1.80          | :16           | .682         | 1.315         |
|                                                                                                                                   |                   |                 | 11:00                              | 2.04              | 1.97          | :20           | .663         | 1.359         |
|                                                                                                                                   |                   |                 | :05                                | .12               | 1.98          | :25           | .606         | 1.412         |
|                                                                                                                                   |                   |                 | :10                                | 1.08              | 2.07          | :35           | .486         | 1.501         |
|                                                                                                                                   |                   |                 | :15                                | .60               | 2.12          | :43           | .393         | 1.560         |
|                                                                                                                                   |                   |                 | :20                                | .48               | 2.16          | :54           | .267         | 1.620         |
|                                                                                                                                   |                   |                 | :30                                | .06               | 2.17          | 12:04p        | .211         | 1.660         |
|                                                                                                                                   |                   |                 | :35                                | .12               | 2.18          | :19           | .154         | 1.706         |
|                                                                                                                                   |                   |                 | :50                                | .04               | 2.19          | :37           | .112         | 1.746         |
|                                                                                                                                   |                   |                 | 12:35p                             | .01               | 2.20          | :57           | .0774        | 1.777         |
|                                                                                                                                   |                   |                 | 1:30                               | 0                 | 2.20          | 1:24          | .0512        | 1.806         |
|                                                                                                                                   |                   |                 | 2:05                               | .02               | 2.21          | 2:28          | .0292        | 1.847         |
|                                                                                                                                   |                   |                 |                                    |                   |               | 3:52          | .0179        | 1.880         |
|                                                                                                                                   |                   |                 |                                    |                   |               | 5:21          | .0105        | 1.900         |
|                                                                                                                                   |                   |                 |                                    |                   |               | 7:34          | .0060        | 1.918         |
|                                                                                                                                   |                   |                 |                                    |                   |               | 9:56          | .0036        | 1.929         |
|                                                                                                                                   |                   |                 |                                    |                   |               | 12:00m        | .0022        | 1.935         |
|                                                                                                                                   |                   |                 |                                    |                   |               | 10-3-59       |              |               |
|                                                                                                                                   |                   |                 |                                    |                   |               | 12:48a/       | .00171/      | 1.937         |

Notes: To convert runoff in in/hr to cfs, multiply . 16.839 .  
 1/ Beginning of new runoff event.

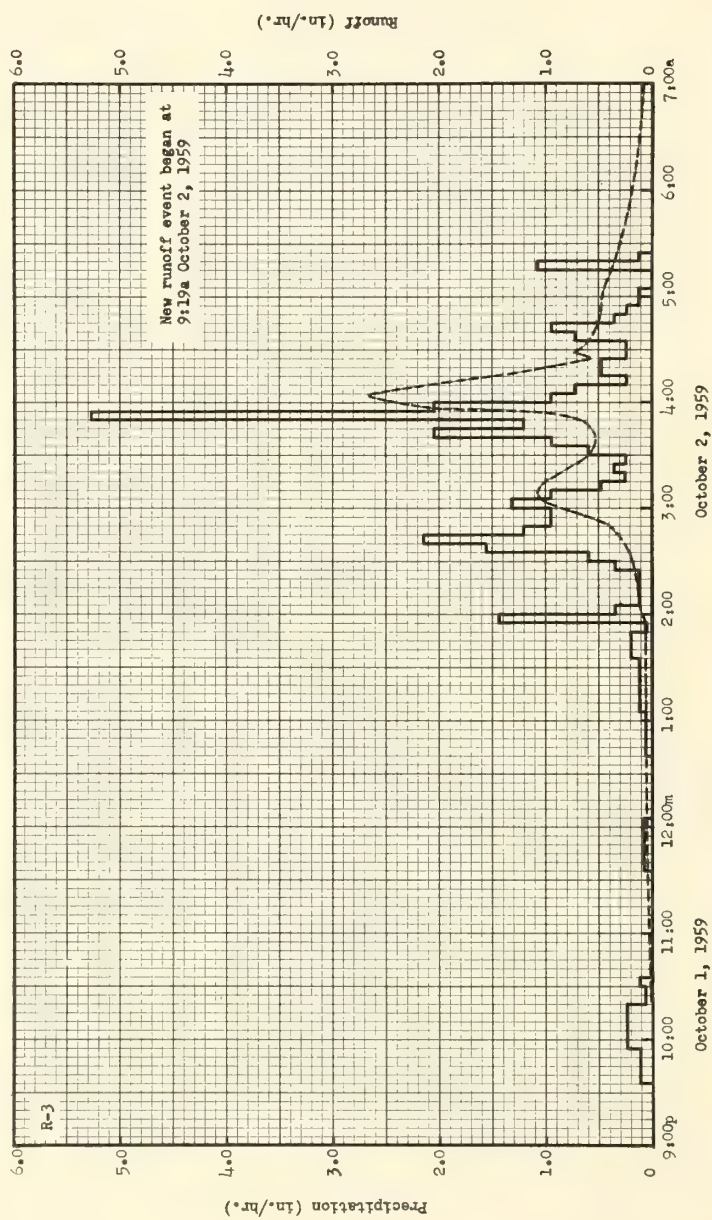






STILLWATER, OKLAHOMA WATERSHED W-1



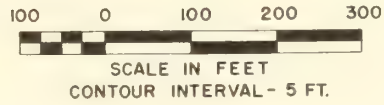


STILLWATER, OKLAHOMA WATERSHED W-1

# WATERSHED CHARACTERISTICS

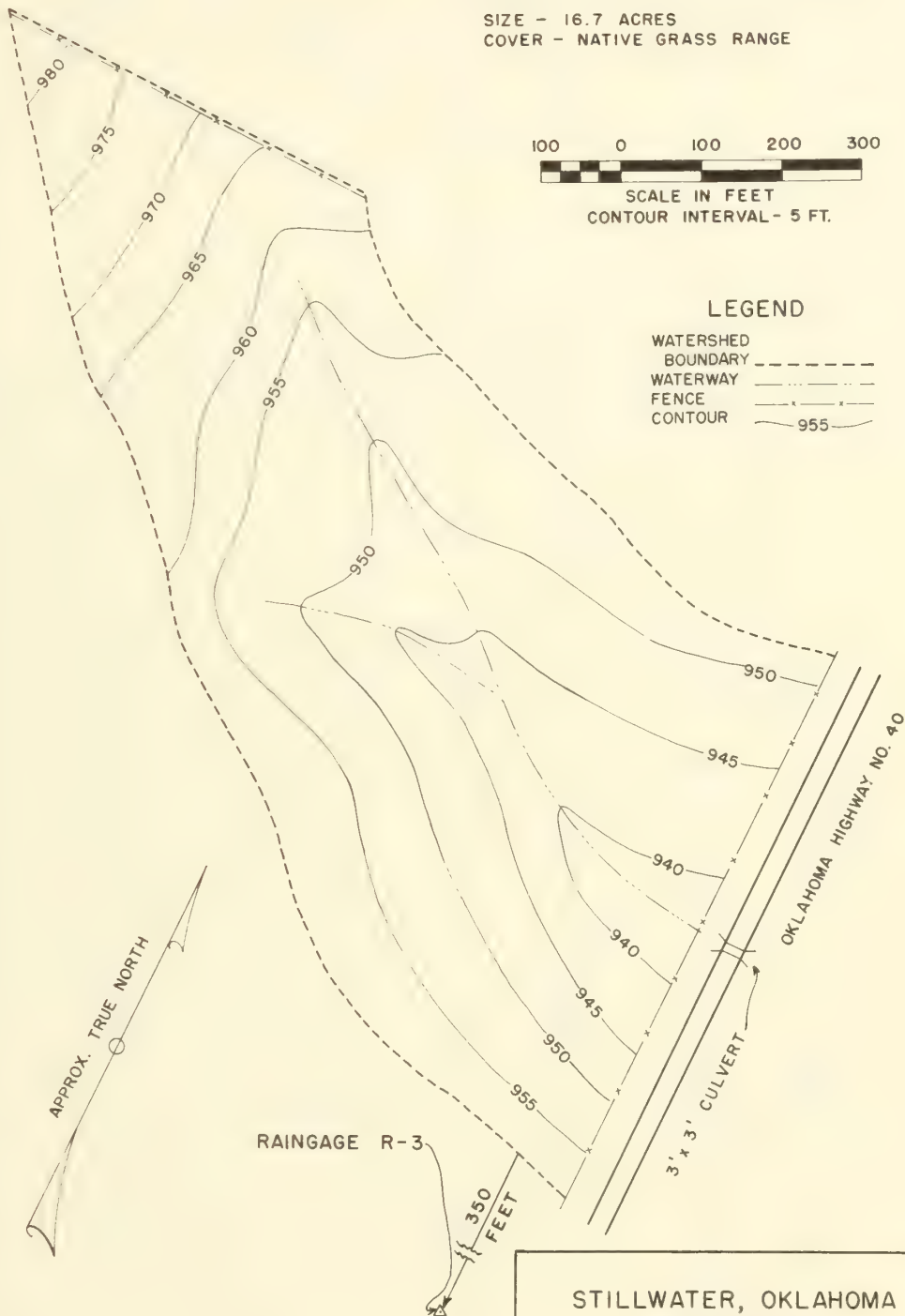
SIZE - 16.7 ACRES

COVER - NATIVE GRASS RANGE



## LEGEND

WATERSHED  
BOUNDARY -----  
WATERWAY .....  
FENCE - x - x - x -  
CONTOUR 955 ~~~~~



STILLWATER, OKLAHOMA  
WATERSHED W-1

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                      |                                     |                    |                                           |                  |                      |                  |               | Stillwater, Oklahoma Watershed W-3<br>(Area - 92.0 acres) |                 |                  |             |             |                |      |        |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------|-------------------------------------------|------------------|----------------------|------------------|---------------|-----------------------------------------------------------|-----------------|------------------|-------------|-------------|----------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                  | Jan.                                | Feb.               | Mar.                                      | Apr.             | May                  | June             | July          | Aug.                                                      | Sept.           | Oct.             | Nov.        | Dec.        | Year           |      |        |      |
| 1956 P<br>Q <sub>1</sub>                                                                                                                                                                                                                                                                                       | 0.50<br>0                           | 0.81<br>0          | 0.52<br>0                                 | 1.24<br>0        | 2.28<br>0            | 1.98<br>0        | 3.32<br>.01   | 0.73<br>0                                                 | 0.15<br>0       | 1.52<br>0        | 1.55<br>0   | 1.46<br>0   | 16.06<br>.01   |      |        |      |
| 1957 P<br>Q                                                                                                                                                                                                                                                                                                    | .60<br>0                            | 1.96<br>0          | 2.54<br>.07                               | 8.11<br>4.99     | 9.94<br>4.77         | 11.30<br>6.32    | 1.60<br>.68   | 1.02<br>0                                                 | 4.48<br>.04     | 1.38<br>0        | 2.40<br>.03 | .66<br>0    | 45.99<br>16.90 |      |        |      |
| 1958 P<br>Q                                                                                                                                                                                                                                                                                                    | 1.13<br>.09                         | 1.05<br>.07        | 4.40<br>2.65                              | 1.50<br>.29      | 1.71<br>0            | 3.97<br>0        | 6.23<br>.06   | 3.40<br>.01                                               | 3.30<br>.02     | .20<br>0         | .67<br>0    | .79<br>0    | 28.35<br>3.19  |      |        |      |
| 1959 P<br>Q                                                                                                                                                                                                                                                                                                    | .27<br>0                            | .84<br>0           | 1.73<br>.04                               | 3.38<br>.38      | 5.08<br>.91          | 3.76<br>0        | 10.47<br>3.93 | 2.41<br>.10                                               | 8.24<br>1.95    | 10.00<br>8.03    | .15<br>0    | 1.87<br>.65 | 48.20<br>15.99 |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                     |                                     |                    |                                           |                  |                      |                  |               | Stillwater, Oklahoma Watershed W-3                        |                 |                  |             |             |                |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                           | MAXIMUM<br>DISCHARGE                |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                  |                      |                  |               |                                                           |                 |                  |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    | 1 hour                                    |                  | 2 hours              |                  | 6 hours       |                                                           | 12 hours        |                  | 1 day       |             | 2 days         |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                | Date                                | Rate               | Date                                      | Vol.             | Date                 | Vol.             | Date          | Vol.                                                      | Date            | Vol.             | Date        | Vol.        | Date           | Vol. | Date   | Vol. |
| 1957                                                                                                                                                                                                                                                                                                           | 4-18                                | 4.52               | 4-18                                      | 2.08             | 4-18                 | 2.50             | 4-18          | 2.67                                                      | 4-18            | 2.70             | 4-18        | 2.76        | 4-18           | 2.89 | 4-18   | 4.70 |
| 1958                                                                                                                                                                                                                                                                                                           | 3-28                                | .41                | 3-28                                      | .35              | 3-28                 | .51              | 3-28          | .63                                                       | 3-28            | .66              | 3-28        | .67         | 3-22           | .71  | 3-22   | 1.45 |
| 1959                                                                                                                                                                                                                                                                                                           | 10-2                                | 1.75               | 10-2                                      | 1.24             | 10-2                 | 2.05             | 10-2          | 2.87                                                      | 10-2            | 4.96             | 10-1        | 5.18        | 10-1           | 6.08 | 9-30   | 8.08 |
| Notes: Quality of records: Precipitation and Runoff, good. Watershed Conditions: 1956 - poor cover; 1957-1959 - good to excellent cover. Runoff retained by pond added to runoff total. <sub>1</sub> / No significant runoff in 1956.                                                                          |                                     |                    |                                           |                  |                      |                  |               |                                                           |                 |                  |             |             |                |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                         |                                     |                    |                                           |                  |                      |                  |               | Stillwater, Oklahoma Watershed W-3                        |                 |                  |             |             |                |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                          |                                     |                    |                                           | Rainfall         |                      |                  |               | Runoff                                                    |                 |                  |             |             |                |      |        |      |
| Date                                                                                                                                                                                                                                                                                                           | Rainfall <sub>2</sub> /<br>(inches) | Runoff<br>(inches) |                                           | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) |               | Date and<br>time                                          | Rate<br>(in/hr) | Acc.<br>(inches) |             |             |                |      |        |      |
| Event of October 1 and 2, 1959                                                                                                                                                                                                                                                                                 |                                     |                    |                                           |                  |                      |                  |               |                                                           |                 |                  |             |             |                |      |        |      |
| 9-1-59                                                                                                                                                                                                                                                                                                         | 1.33                                | .050               |                                           | 10-1-59          | Raingage             | R-3              |               | 10-1-59                                                   |                 |                  |             |             |                |      |        |      |
| 9-2                                                                                                                                                                                                                                                                                                            | 0                                   | .004               |                                           | 9:35p            | 0                    | 0                |               | 9:50p                                                     | .0056           | 0                |             |             |                |      |        |      |
| 9-3                                                                                                                                                                                                                                                                                                            | .39                                 | .004               |                                           | :55              | .12                  | .04              |               | 10:31                                                     | .0114           | .005             |             |             |                |      |        |      |
| 9-4                                                                                                                                                                                                                                                                                                            | 0                                   | .002               |                                           | 10:00            | .24                  | .06              |               | :53                                                       | .0207           | .011             |             |             |                |      |        |      |
| 9-17                                                                                                                                                                                                                                                                                                           | .08                                 | 0                  |                                           | :10              | .24                  | .10              |               | 12:00m                                                    | .0319           | .040             |             |             |                |      |        |      |
| 9-23                                                                                                                                                                                                                                                                                                           | .49                                 | 0                  |                                           | :20              | .24                  | .14              |               | 10-2-59                                                   |                 |                  |             |             |                |      |        |      |
| 9-24                                                                                                                                                                                                                                                                                                           | 1.42                                | .643               |                                           | :30              | .06                  | .15              |               | 12:20a                                                    | .0331           | .051             |             |             |                |      |        |      |
| 9-25                                                                                                                                                                                                                                                                                                           | 3.70                                | 1.174              |                                           | :35              | .12                  | .16              |               | 1:03                                                      | .0285           | .073             |             |             |                |      |        |      |
| 9-26                                                                                                                                                                                                                                                                                                           | 0                                   | .008               |                                           | ceased           |                      |                  |               | :32                                                       | .0314           | .087             |             |             |                |      |        |      |
| 9-27                                                                                                                                                                                                                                                                                                           | 0                                   | .002               |                                           | 11:35            | 0                    | .16              |               | :54                                                       | .0431           | .101             |             |             |                |      |        |      |
| 9-29                                                                                                                                                                                                                                                                                                           | .32                                 | 0                  |                                           | 10-2-59          |                      |                  |               | 2:06                                                      | .0751           | .112             |             |             |                |      |        |      |
| 9-30                                                                                                                                                                                                                                                                                                           | .51                                 | .059               |                                           | 12:05a           | .08                  | .20              |               | :13                                                       | .101            | .122             |             |             |                |      |        |      |
| 10-1                                                                                                                                                                                                                                                                                                           | .94 <sub>3</sub>                    | .585               |                                           | :40              | 0                    | .20              |               | :29                                                       | .157            | .156             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | 1:05             | .06                  | .23              |               | :40                                                       | .197            | .188             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :35              | .12                  | .29              |               | :47                                                       | .275            | .215             |             |             |                |      |        |      |
| Watershed Conditions: 100% of the area was in native grass pasture. The upper or western third was in poor to fair condition, the lower portion was in very good condition.                                                                                                                                    |                                     |                    |                                           | :50              | .20                  | .34              |               | :53                                                       | .406            | .249             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :55              | .12                  | .35              |               | :58                                                       | .555            | .288             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | 2:00             | 1.44                 | .47              |               | 3:04                                                      | .698            | .350             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :05              | .36                  | .50              |               | :15                                                       | .919            | .502             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :20              | .12                  | .53              |               | :21                                                       | .938            | .595             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :25              | .12                  | .54              |               | :25                                                       | .913            | .657             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :30              | .36                  | .57              |               | :36                                                       | .789            | .811             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :35              | .60                  | .62              |               | :46                                                       | .757            | .942             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :40              | 1.56                 | .75              |               | :52                                                       | .826            | 1.020            |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :45              | 2.16                 | .93              |               | :56                                                       | 1.062           | 1.082            |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :50              | 1.20                 | 1.03             |               | :59                                                       | 1.267           | 1.139            |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :55              | .96                  | 1.11             |               | 4:01                                                      | 1.374           | 1.183            |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | 3:00             | .96                  | 1.19             |               | :03                                                       | 1.606           | 1.233            |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :05              | 1.32                 | 1.30             |               | :07                                                       | 1.749           | 1.343            |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                |                                     |                    |                                           | :10              | .96                  | 1.38             |               | :14                                                       | 1.748           | 1.547            |             |             |                |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 92.766. For map of watershed, see page 37.2-6, Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS, SWC, January 1960. <sub>2</sub> / All antecedent rainfall measured by Raingage R-3. <sub>3</sub> / Rainfall to 5:25p. |                                     |                    |                                           |                  |                      |                  |               |                                                           |                 |                  |             |             |                |      |        |      |

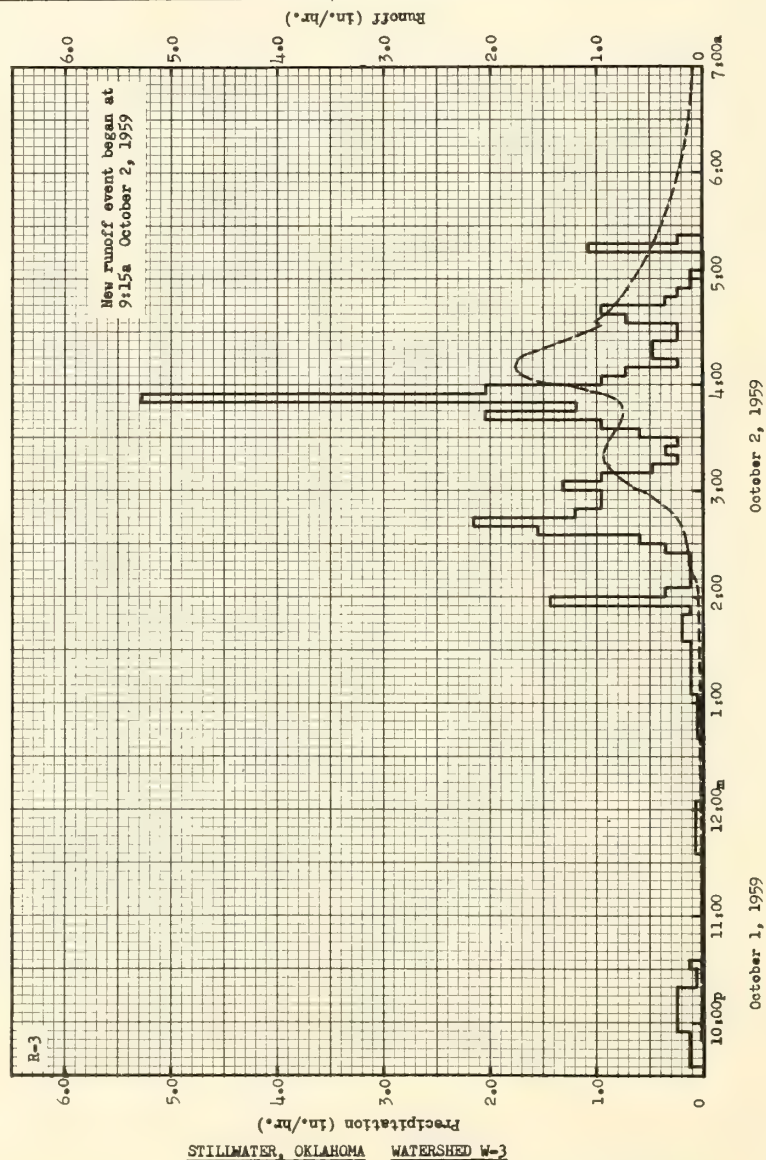
Cooperative Research Project of USDA and Oklahoma Agricultural Experiment Station

| SELECTED RUNOFF EVENTS                                                                                                                                                             |                      |                    | Stillwater, Oklahoma Watershed W-3 |                      |                  |                  |                 |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                              |                      |                    | Rainfall                           |                      |                  | Runoff           |                 |                  |
| Date                                                                                                                                                                               | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                   | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| <u>Event of October 1 and 2, 1959 - Continued</u>                                                                                                                                  |                      |                    |                                    |                      |                  |                  |                 |                  |
|                                                                                                                                                                                    |                      |                    | 3:15                               | .48                  | 1.42             | 4:18             | 1.620           | 1.660            |
|                                                                                                                                                                                    |                      |                    | :20                                | .24                  | 1.44             | :22              | 1.432           | 1.762            |
|                                                                                                                                                                                    |                      |                    | :25                                | .36                  | 1.47             | :29              | 1.160           | 1.913            |
|                                                                                                                                                                                    |                      |                    | :30                                | .24                  | 1.49             | :32              | 1.019           | 1.968            |
|                                                                                                                                                                                    |                      |                    | :35                                | .60                  | 1.54             | :33              | .957            | 1.985            |
|                                                                                                                                                                                    |                      |                    | :40                                | .96                  | 1.62             | :34              | .990            | 2.001            |
|                                                                                                                                                                                    |                      |                    | :45                                | 2.04                 | 1.79             | :36              | 1.023           | 2.035            |
|                                                                                                                                                                                    |                      |                    | :50                                | 1.20                 | 1.89             | :40              | .907            | 2.099            |
|                                                                                                                                                                                    |                      |                    | :55                                | 5.28                 | 2.33             | :47              | .797            | 2.198            |
|                                                                                                                                                                                    |                      |                    | 4:00                               | 2.04                 | 2.50             | :59              | .681            | 2.346            |
|                                                                                                                                                                                    |                      |                    | :05                                | .96                  | 2.58             | 5:16             | .498            | 2.511            |
|                                                                                                                                                                                    |                      |                    | :10                                | .72                  | 2.64             | :28              | .414            | 2.602            |
|                                                                                                                                                                                    |                      |                    | :15                                | .24                  | 2.66             | :50              | .285            | 2.731            |
|                                                                                                                                                                                    |                      |                    | :20                                | .48                  | 2.70             | 6:05             | .213            | 2.793            |
|                                                                                                                                                                                    |                      |                    | :25                                | .48                  | 2.74             | :47              | .101            | 2.902            |
|                                                                                                                                                                                    |                      |                    | :30                                | .24                  | 2.76             | 7:33             | .0495           | 2.958            |
|                                                                                                                                                                                    |                      |                    | :35                                | .24                  | 2.78             | :59              | .0361           | 2.976            |
|                                                                                                                                                                                    |                      |                    | :40                                | .72                  | 2.84             | 8:43             | .0230           | 2.997            |
|                                                                                                                                                                                    |                      |                    | :45                                | .96                  | 2.93             | 9:15a1/          | .01811/         | 3.008            |
|                                                                                                                                                                                    |                      |                    | :50                                | .36                  | 2.96             |                  |                 |                  |
|                                                                                                                                                                                    |                      |                    | :55                                | .24                  | 2.98             |                  |                 |                  |
|                                                                                                                                                                                    |                      |                    | 5:00                               | .12                  | 2.99             |                  |                 |                  |
|                                                                                                                                                                                    |                      |                    | :05                                | .12                  | 3.00             |                  |                 |                  |
|                                                                                                                                                                                    |                      |                    | :15                                | 0                    | 3.00             |                  |                 |                  |
|                                                                                                                                                                                    |                      |                    | :20                                | 1.08                 | 3.09             |                  |                 |                  |
|                                                                                                                                                                                    |                      |                    | :25a                               | .24                  | 3.11             |                  |                 |                  |
| <u>Event of October 2 and 3, 1959</u>                                                                                                                                              |                      |                    |                                    |                      |                  |                  |                 |                  |
| 9-1-59                                                                                                                                                                             | 1.33                 | .050               | 10-2-59                            | Raingage             | R-3              | 10-2-59          |                 |                  |
| 9-2                                                                                                                                                                                | 0                    | .001               | 7:40a                              | 0                    |                  | 9:15a            | .0181           | 0                |
| 9-3                                                                                                                                                                                | .39                  | .001               | 8:20                               | .03                  | .02              | :21              | .0322           | .002             |
| 9-4                                                                                                                                                                                | 0                    | .002               | 9:20                               | .02                  | .04              | :25              | .0646           | .005             |
| 9-17                                                                                                                                                                               | .08                  | 0                  | :25                                | 1.08                 | .38              | :30              | .142            | .013             |
| 9-23                                                                                                                                                                               | .49                  | 0                  | :30                                | 3.60                 | .68              | :35              | .267            | .030             |
| 9-24                                                                                                                                                                               | 1.42                 | .643               | :35                                | 2.76                 | .91              | :40              | .524            | .063             |
| 9-25                                                                                                                                                                               | 3.70                 | 1.174              | :40                                | 1.80                 | 1.06             | :45              | .867            | .120             |
| 9-26                                                                                                                                                                               | 0                    | .008               | :45                                | .96                  | 1.14             | :49              | 1.04            | .185             |
| 9-27                                                                                                                                                                               | 0                    | .002               | :50                                | 1.56                 | 1.27             | :54              | 1.18            | .278             |
| 9-29                                                                                                                                                                               | .32                  | 0                  | :55                                | .60                  | 1.32             | :57              | 1.22            | .338             |
| 9-30                                                                                                                                                                               | .51                  | .059               | 10:00                              | 1.32                 | 1.43             | 10:00            | 1.24            | .400             |
| 10-1                                                                                                                                                                               | 1.10                 | .625               | :05                                | .60                  | 1.48             | :03              | 1.23            | .462             |
| 10-2                                                                                                                                                                               | 2.952/               | 2.968              | :10                                | .96                  | 1.56             | :05              | 1.21            | .502             |
|                                                                                                                                                                                    |                      |                    | :15                                | .36                  | 1.59             | :10              | 1.17            | .601             |
| <u>Watershed Conditions:</u> 100% of the area was in native grass pasture. The upper or western third was in poor to fair condition, the lower portion was in very good condition. |                      |                    | :20                                | .12                  | 1.60             | :15              | 1.10            | .695             |
|                                                                                                                                                                                    |                      |                    | :25                                | .24                  | 1.62             | :21              | .948            | .798             |
|                                                                                                                                                                                    |                      |                    | :30                                | .24                  | 1.64             | :26              | .874            | .875             |
|                                                                                                                                                                                    |                      |                    | :35                                | .36                  | 1.67             | :33              | .766            | .970             |
|                                                                                                                                                                                    |                      |                    | :40                                | .12                  | 1.68             | :39              | .675            | 1.042            |
|                                                                                                                                                                                    |                      |                    | :45                                | 0                    | 1.68             | :45              | .581            | 1.105            |
|                                                                                                                                                                                    |                      |                    | :50                                | .12                  | 1.69             | :51              | .494            | 1.159            |
|                                                                                                                                                                                    |                      |                    | :55                                | 1.32                 | 1.80             | :57              | .465            | 1.207            |
|                                                                                                                                                                                    |                      |                    | 11:00                              | 2.04                 | 1.97             | 11:01            | .466            | 1.238            |
|                                                                                                                                                                                    |                      |                    | :05                                | .12                  | 1.98             | :06              | .482            | 1.277            |
|                                                                                                                                                                                    |                      |                    | :10                                | 1.08                 | 2.07             | :15              | .557            | 1.355            |
|                                                                                                                                                                                    |                      |                    | :15                                | .60                  | 2.12             | :25              | .633            | 1.455            |
|                                                                                                                                                                                    |                      |                    | :20                                | .48                  | 2.16             | :35              | .625            | 1.562            |
|                                                                                                                                                                                    |                      |                    | :30                                | .06                  | 2.17             | :44              | .550            | 1.650            |
|                                                                                                                                                                                    |                      |                    | :35                                | .12                  | 2.18             | :52              | .467            | 1.718            |
|                                                                                                                                                                                    |                      |                    | :50                                | .04                  | 2.19             | 12:01p           | .388            | 1.782            |
|                                                                                                                                                                                    |                      |                    | 12:35p                             | .01                  | 2.20             | :15              | .209            | 1.855            |
|                                                                                                                                                                                    |                      |                    | 1:30                               | 0                    | 2.20             | :32              | .192            | 1.922            |
|                                                                                                                                                                                    |                      |                    | 2:05                               | .03                  | 2.22             | :56              | .111            | 1.953            |
|                                                                                                                                                                                    |                      |                    |                                    |                      |                  | 1:27             | .0625           | 2.020            |
| Notes: To convert runoff in in/hr to cfs, multiply by 92.766. 1/ Beginning of new runoff event. 2/ rainfall to 5:25a.                                                              |                      |                    |                                    |                      |                  |                  |                 |                  |

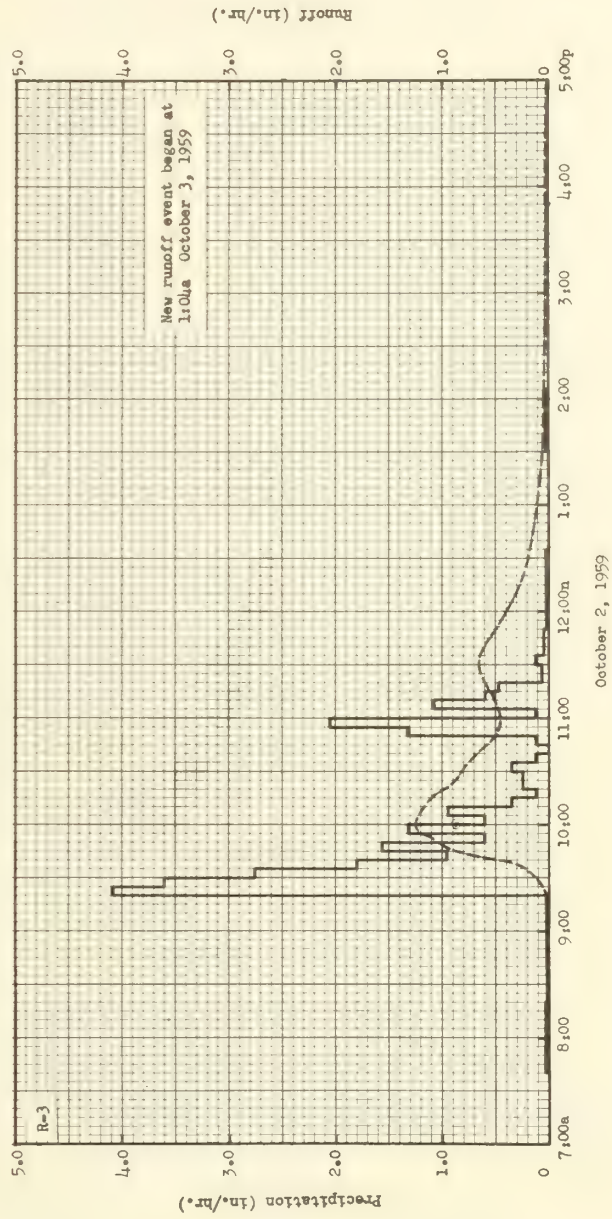


| SELECTED RUNOFF EVENTS                     |                   |                 |               |                   |               | Stillwater, Oklahoma Watershed W-3 |                     |               |
|--------------------------------------------|-------------------|-----------------|---------------|-------------------|---------------|------------------------------------|---------------------|---------------|
| Antecedent conditions                      |                   |                 | Rainfall      |                   |               | Runoff                             |                     |               |
| Date                                       | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                      | Rate (in/hr)        | Acc. (inches) |
| Event of October 2 and 3, 1959 - Continued |                   |                 |               |                   |               | 2:11p                              | .0374               | 2.061         |
|                                            |                   |                 |               |                   |               | 4:24                               | .0155               | 2.114         |
|                                            |                   |                 |               |                   |               | 5:44                               | .0094               | 2.131         |
|                                            |                   |                 |               |                   |               | 7:40                               | .0058               | 2.145         |
|                                            |                   |                 |               |                   |               | 9:58                               | .0034               | 2.155         |
|                                            |                   |                 |               |                   |               | 12:00m                             | .0026               | 2.161         |
|                                            |                   |                 |               |                   |               | 10-3-59                            |                     |               |
|                                            |                   |                 |               |                   |               | 1:04a <sup>1/</sup>                | .0025 <sup>1/</sup> | 2.164         |

Notes: To convert runoff in in/hr to cfs, multiply by 92.766. <sup>1/</sup> Beginning of new runoff event.



STILLWATER, OKLAHOMA WATERSHED W-3



| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                           |                         |      |                                           |                  |                      |                  |                  | Stillwater, Oklahoma Watershed W-4<br>(Area - 206 acres) |                  |       |       |      |        |      |        |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|-------------------------------------------|------------------|----------------------|------------------|------------------|----------------------------------------------------------|------------------|-------|-------|------|--------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                       | Jan.                    | Feb. | Mar.                                      | Apr.             | May                  | June             | July             | Aug.                                                     | Sept.            | Oct.  | Nov.  | Dec. | Year   |      |        |      |
| 1956 P                                                                                                                                                                                                              | 0.45                    | 0.69 | 0.54                                      | 1.10             | 2.42                 | 1.83             | 3.70             | 0.84                                                     | 0.19             | 0.88  | 1.41  | 1.39 | 15.74  |      |        |      |
| Q                                                                                                                                                                                                                   | 0                       | 0    | 0                                         | 0                | 0                    | 0                | .38              | 0                                                        | 0                | 0     | .01   | 0    | .39    |      |        |      |
| 1957 P                                                                                                                                                                                                              | .54                     | 2.27 | 2.95                                      | 7.26             | 9.68                 | 10.21            | 1.56             | .82                                                      | 4.56             | 1.52  | 2.19  | .70  | 44.26  |      |        |      |
| Q                                                                                                                                                                                                                   | 0                       | .02  | .05                                       | 3.48             | 4.10                 | 6.11             | .71              | 0                                                        | .23              | 0     | 0     | 0    | 14.70  |      |        |      |
| 1958 P                                                                                                                                                                                                              | .82                     | .85  | 4.15                                      | 1.44             | 1.28                 | 4.51             | 5.20             | 3.23                                                     | 3.56             | .22   | .33   | .58  | 26.17  |      |        |      |
| Q                                                                                                                                                                                                                   | .06                     | .05  | 1.95                                      | .22              | .02                  | .16              | .23              | .01                                                      | .07              | 0     | 0     | 0    | 2.77   |      |        |      |
| 1959 P                                                                                                                                                                                                              | .17                     | .69  | 1.72                                      | 3.18             | 5.05                 | 3.81             | 10.04            | 2.48                                                     | 8.06             | 10.13 | .18   | 1.73 | 47.24  |      |        |      |
| Q                                                                                                                                                                                                                   | 0                       | 0    | .02                                       | .14              | .38                  | .02              | 3.33             | .02                                                      | 1.50             | 6.78  | 0     | .37  | 12.56  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                             |                         |      |                                           |                  |                      |                  |                  | Stillwater, Oklahoma Watershed W-4                       |                  |       |       |      |        |      |        |      |
| YEAR                                                                                                                                                                                                                | MAXIMUM DISCHARGE       |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                  |                      |                  |                  |                                                          |                  |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      | 1 hour                                    |                  | 2 hours              |                  | 6 hours          |                                                          | 12 hours         |       | 1 day |      | 2 days |      | 8 days |      |
|                                                                                                                                                                                                                     | Date                    | Rate | Date                                      | Vol.             | Date                 | Vol.             | Date             | Vol.                                                     | Date             | Vol.  | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1956                                                                                                                                                                                                                | 7-5                     | .45  | 7-5                                       | 0.33             | 7-5                  | 0.37             | 7-5              | 0.38                                                     | 7-5              | 0.38  | 7-5   | 0.38 | 7-5    | 0.38 | 7-5    | 0.38 |
| 1957                                                                                                                                                                                                                | 4-18                    | 2.39 | 4-18                                      | 1.48             | 4-18                 | 1.75             | 5-16             | 1.92                                                     | 5-16             | 1.95  | 5-16  | 2.00 | 5-16   | 2.06 | 6-17   | 3.51 |
| 1958                                                                                                                                                                                                                | 3-28                    | .39  | 3-28                                      | .32              | 3-28                 | .45              | 3-28             | .56                                                      | 3-28             | .60   | 3-28  | .63  | 3-28   | .64  | 3-23   | 1.06 |
| 1959                                                                                                                                                                                                                | 10-2                    | 1.63 | 10-2                                      | 1.19             | 10-2                 | 1.19             | 10-2             | 2.63                                                     | 10-2             | 4.49  | 10-2  | 4.71 | 10-1   | 5.23 | 9-30   | 6.77 |
| Notes: Quality of records: Precipitation and Runoff, good. Watershed Conditions: 1956 - poor cover; 1957-1959 good to excellent cover.                                                                              |                         |      |                                           |                  |                      |                  |                  |                                                          |                  |       |       |      |        |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                              |                         |      |                                           |                  |                      |                  |                  | Stillwater, Oklahoma Watershed W-4                       |                  |       |       |      |        |      |        |      |
| Antecedent conditions                                                                                                                                                                                               |                         |      |                                           | Rainfall         |                      |                  |                  | Runoff                                                   |                  |       |       |      |        |      |        |      |
| Date                                                                                                                                                                                                                | Rainfall 1/<br>(inches) |      | Runoff<br>(inches)                        | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr)                                          | Acc.<br>(inches) |       |       |      |        |      |        |      |
| Event of April 18, 1957                                                                                                                                                                                             |                         |      |                                           |                  |                      |                  |                  |                                                          |                  |       |       |      |        |      |        |      |
| 3-20-57                                                                                                                                                                                                             | .32                     |      | 0                                         | 4-18-57          | Raingage             | R-4              | 4-18-57          |                                                          |                  |       |       |      |        |      |        |      |
| 3-21                                                                                                                                                                                                                | .34                     |      | 0                                         | 12:20a           | 0                    | 0                | 1:10a            | 0                                                        |                  |       |       |      |        |      |        |      |
| 3-23                                                                                                                                                                                                                | .55                     |      | .0152                                     | :25              | .12                  | .01              | :12              | .0005                                                    | .0001            |       |       |      |        |      |        |      |
| 3-24                                                                                                                                                                                                                | 0                       |      | .0005                                     | :30              | .12                  | .02              | :14              | .0020                                                    | .0001            |       |       |      |        |      |        |      |
| 3-26                                                                                                                                                                                                                | .08                     |      | 0                                         | :35              | .12                  | .03              | :17              | .0032                                                    | .0002            |       |       |      |        |      |        |      |
| 3-30                                                                                                                                                                                                                | .13                     |      | 0                                         | :40              | 0                    | .03              | :30              | .0012                                                    | .0007            |       |       |      |        |      |        |      |
| 3-31                                                                                                                                                                                                                | .52                     |      | .0082                                     | :45              | .12                  | .04              | :37              | .0007                                                    | .0008            |       |       |      |        |      |        |      |
| 4-3                                                                                                                                                                                                                 | .80                     |      | .0891                                     | :50              | .12                  | .05              | :38              | .0015                                                    | .0008            |       |       |      |        |      |        |      |
| 4-4                                                                                                                                                                                                                 | 0                       |      | .0039                                     | :55              | .24                  | .07              | :39              | .0037                                                    | .0009            |       |       |      |        |      |        |      |
| 4-7                                                                                                                                                                                                                 | .10                     |      | 0                                         | 1:00             | .48                  | .11              | :40              | .0061                                                    | .0010            |       |       |      |        |      |        |      |
| 4-8                                                                                                                                                                                                                 | .05                     |      | 0                                         | :05              | 2.04                 | .28              | :45              | .0112                                                    | .0017            |       |       |      |        |      |        |      |
| 4-12                                                                                                                                                                                                                | .13                     |      | 0                                         | :10              | .96                  | .36              | 2:00             | .0061                                                    | .0038            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :15              | .24                  | .38              | :08              | .0061                                                    | .0047            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :20              | .12                  | .39              | :42              | .0030                                                    | .0072            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :50              | 0                    | .39              | :46              | .0027                                                    | .0074            |       |       |      |        |      |        |      |
| Watershed Conditions: 100% of the area was in native grass, most in pasture except for a small part in meadow. The range had been over grazed and had experienced severe drought in 1956 and was in poor condition. |                         |      |                                           |                  |                      |                  |                  |                                                          |                  |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :55              | .12                  | .40              | :58              | .0055                                                    | .0082            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | 2:15             | 0                    | .40              | 3:02             | .0059                                                    | .0086            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :20              | .72                  | .46              | :14              | .0197                                                    | .0112            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :25              | .24                  | .48              | :18              | .0368                                                    | .0131            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :30              | .12                  | .49              | :21              | .0569                                                    | .0154            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :35              | .12                  | .50              | :23              | .0800                                                    | .0177            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :40              | .12                  | .51              | :28              | .137                                                     | .0267            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :45              | .48                  | .55              | :34              | .268                                                     | .0470            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :50              | .72                  | .61              | :44              | .606                                                     | .1199            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :55              | .36                  | .64              | :54              | .855                                                     | .2446            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | 3:00             | .36                  | .67              | 4:00             | 1.06                                                     | .3375            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :05              | 1.08                 | .76              | :04              | 1.73                                                     | .4305            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :10              | .60                  | .81              | :06              | 2.50                                                     | .5011            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :15              | 1.08                 | .90              | :08              | 2.79                                                     | .5894            |       |       |      |        |      |        |      |
|                                                                                                                                                                                                                     |                         |      |                                           | :20              | .84                  | .97              | :12              | 2.74                                                     | .7738            |       |       |      |        |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 207.72 .<br>1/ All antecedent rainfall measured by Raingage R-4.                                                                                              |                         |      |                                           |                  |                      |                  |                  |                                                          |                  |       |       |      |        |      |        |      |

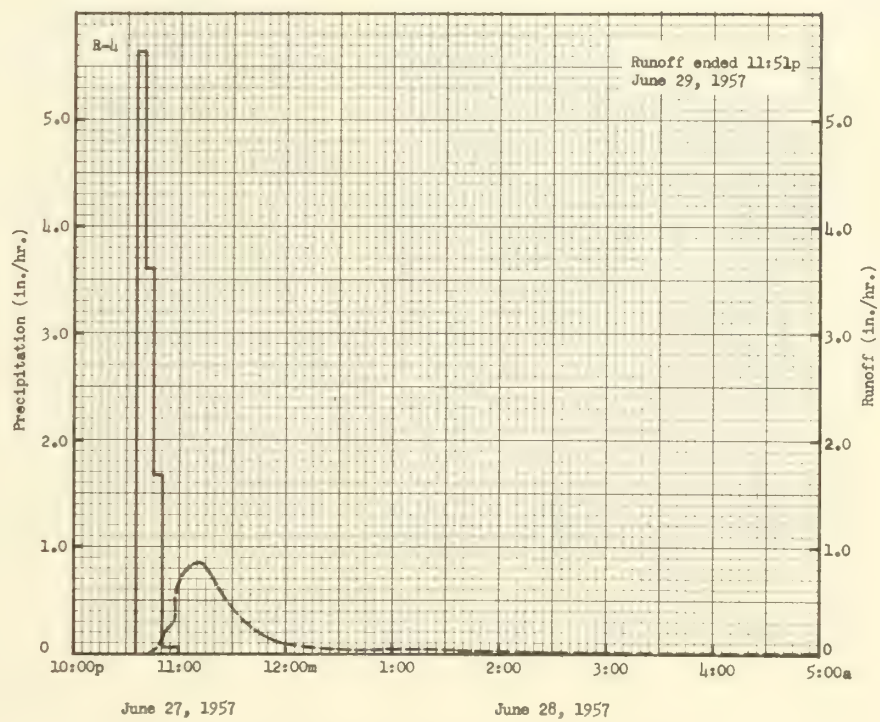
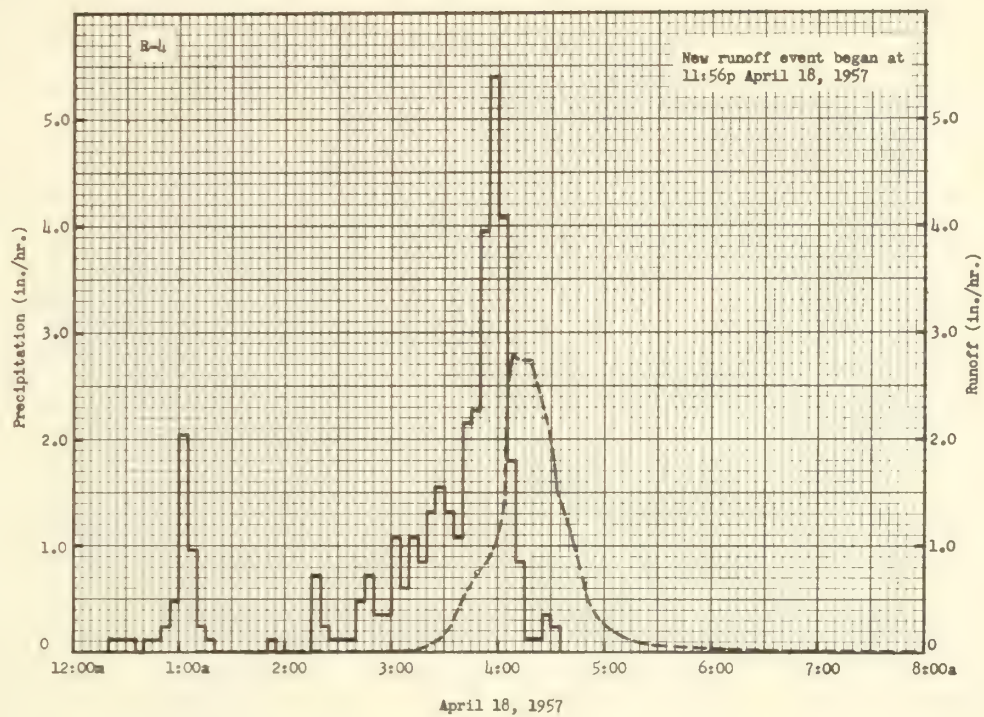
Cooperative Research Project of USDA and Oklahoma Agricultural Experiment Station



| SELECTED RUNOFF EVENTS                                                                                                                                                                             |                      |                    |                  |                      |                  | Stillwater, Oklahoma Watershed W-4 |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                              |                      |                    | Rainfall         |                      |                  | Runoff                             |                 |                  |
| Date                                                                                                                                                                                               | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| <u>Event of April 18, 1957 - Continued</u>                                                                                                                                                         |                      |                    |                  |                      |                  |                                    |                 |                  |
|                                                                                                                                                                                                    |                      |                    | 3:25a            | 1.32                 | 1.08             | 4:18a                              | 2.74            | 1.0483           |
|                                                                                                                                                                                                    |                      |                    | :30              | 1.56                 | 1.21             | :22                                | 2.58            | 1.2256           |
|                                                                                                                                                                                                    |                      |                    | :35              | 1.32                 | 1.32             | :28                                | 2.13            | 1.4610           |
|                                                                                                                                                                                                    |                      |                    | :40              | 1.08                 | 1.41             | :34                                | 1.50            | 1.6420           |
|                                                                                                                                                                                                    |                      |                    | :45              | 2.16                 | 1.59             | :38                                | 1.13            | 1.7293           |
|                                                                                                                                                                                                    |                      |                    | :50              | 2.28                 | 1.78             | :44                                | .951            | 1.8333           |
|                                                                                                                                                                                                    |                      |                    | :55              | 3.96                 | 2.11             | :48                                | .629            | 1.8859           |
|                                                                                                                                                                                                    |                      |                    | 4:00             | 5.40                 | 2.56             | :52                                | .467            | 1.9224           |
|                                                                                                                                                                                                    |                      |                    | :05              | 4.08                 | 2.90             | 5:00                               | .256            | 1.9706           |
|                                                                                                                                                                                                    |                      |                    | :10              | 1.80                 | 3.05             | :17                                | .109            | 2.0223           |
|                                                                                                                                                                                                    |                      |                    | :15              | .84                  | 3.12             | :30                                | .0701           | 2.0417           |
|                                                                                                                                                                                                    |                      |                    | :20              | .12                  | 3.13             | :44                                | .0467           | 2.0554           |
|                                                                                                                                                                                                    |                      |                    | :25              | .12                  | 3.14             | 6:04                               | .0262           | 2.0675           |
|                                                                                                                                                                                                    |                      |                    | :30              | .36                  | 3.17             | :22                                | .0189           | 2.0743           |
|                                                                                                                                                                                                    |                      |                    | :35              | .24                  | 3.19             | :58                                | .0103           | 2.0830           |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 8:12                               | .0044           | 2.0921           |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 10:22                              | .0019           | 2.0989           |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 3:12p                              | .0007           | 2.1052           |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 11:56 1/2                          | .0003 1/2       | 2.1096           |
| <u>Event of June 27, 28 and 29, 1957</u>                                                                                                                                                           |                      |                    |                  |                      |                  |                                    |                 |                  |
| 5-30-57                                                                                                                                                                                            | .83                  | .0790              | 6-27-57          | Raingage             | R-4              | 6-27-57                            |                 |                  |
| 5-31                                                                                                                                                                                               | .16                  | .0013              | 10:35p           | 0                    | 0                | 10:35p                             | .0002           | 0                |
| 6-1                                                                                                                                                                                                | .27                  | .0306              | :40              | 5.64                 | .47              | :39                                | .0029           | .0002            |
| 6-2                                                                                                                                                                                                | .61                  | .3660              | :45              | 3.60                 | .77              | :41                                | .0065           | .0003            |
| 6-3                                                                                                                                                                                                | .24                  | .1014              | :50              | 1.68                 | .91              | :43                                | .0141           | .0007            |
| 6-4                                                                                                                                                                                                | .18                  | .1428              | 11:00            | .06                  | .92              | :44                                | .0212           | .0009            |
| 6-9                                                                                                                                                                                                | .45                  | .0769              |                  |                      |                  | :45                                | .0318           | .0014            |
| 6-10                                                                                                                                                                                               | 1.21                 | .8150              |                  |                      |                  | :46                                | .0465           | .0020            |
| 6-11                                                                                                                                                                                               | 0                    | .0076              |                  |                      |                  | :47                                | .0627           | .0029            |
| 6-12                                                                                                                                                                                               | .64                  | .3587              |                  |                      |                  | :48                                | .0927           | .0042            |
| 6-13                                                                                                                                                                                               | 0                    | .0097              |                  |                      |                  | :50                                | .136            | .0081            |
| 6-17                                                                                                                                                                                               | .47                  | .0139              |                  |                      |                  | :53                                | .256            | .0179            |
| 6-18                                                                                                                                                                                               | 2.16                 | 1.5331             |                  |                      |                  | :57                                | .585            | .0159            |
| 6-19                                                                                                                                                                                               | 0                    | .0193              |                  |                      |                  | 11:01                              | .728            | .0896            |
| 6-20                                                                                                                                                                                               | 0                    | .0008              |                  |                      |                  | :12                                | .865            | .2357            |
| 6-22                                                                                                                                                                                               | .56                  | 0                  |                  |                      |                  | :23                                | .604            | .3704            |
| 6-23                                                                                                                                                                                               | 2.23                 | 1.9365             |                  |                      |                  | :29                                | .464            | .4238            |
| 6-24                                                                                                                                                                                               | 0                    | .0118              |                  |                      |                  | :39                                | .271            | .4850            |
| 6-26                                                                                                                                                                                               | .51                  | .0333              |                  |                      |                  | 12:00m                             | .1087           | .5445            |
| 6-27                                                                                                                                                                                               | 0                    | .0068 2/           |                  |                      |                  | 6-28-57                            |                 |                  |
| Watershed Conditions: 100% of the area was in native grass, most in pasture except for a small part in meadow. Some recovery from drought was evident and the range was in poor to fair condition. |                      |                    |                  |                      |                  | 12:23a                             | .0614           | .5791            |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | :39                                | .0435           | .5931            |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 1:11                               | .0258           | .6115            |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | :47                                | .0159           | .6240            |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 2:43                               | .0094           | .6359            |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 4:28                               | .0046           | .6481            |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 7:47                               | .0022           | .6594            |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 12:00m                             | .0003           | .6742            |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 6-29-57                            |                 |                  |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | 2:51a                              | .0002           | .6756            |
|                                                                                                                                                                                                    |                      |                    |                  |                      |                  | e 11:51p                           | 0               | .6765            |
| <u>Event of October 1 and 2, 1959</u>                                                                                                                                                              |                      |                    |                  |                      |                  |                                    |                 |                  |
| 9-1-59                                                                                                                                                                                             | 1.09                 | .0567              | 10-1-59          | Raingage             | R-4              | 10-1-59                            |                 |                  |
| 9-2                                                                                                                                                                                                | 0                    | .0015              | 9:30p            | 0                    | 0                | 10:35p                             | .0062           | 0                |
| 9-3                                                                                                                                                                                                | .41                  | .0033              | :45              | .04                  | .01              | 12:00m                             | .0178           | .0265            |
| 9-4                                                                                                                                                                                                | 0                    | .0001              | 10:25            | .24                  | .17              | 10-2-59                            |                 |                  |
| 9-17                                                                                                                                                                                               | .06                  | 0                  | 11:20            | 0                    | .17              | 12:19a                             | .0156           | .0318            |
| 9-23                                                                                                                                                                                               | .63                  | 0                  | 12:00m           | .03                  | .19              | 2:02                               | .0271           | .0587            |
| 9-24                                                                                                                                                                                               | 3.75                 | .5062              | 10-2-59          | .02                  | .20              | :28                                | .0772           | .0796            |
| 9-25                                                                                                                                                                                               | 1.36                 | .8589              | 12:40a           | .02                  | .20              | :39                                | .112            | .0967            |
| 9-26                                                                                                                                                                                               | 0                    | .0113              | 1:50             | .09                  | .31              | :52                                | .232            | .1306            |
| Notes: To convert runoff in in/hr to cfs, multiply by 207.72 .                                                                                                                                     |                      |                    |                  |                      |                  |                                    |                 |                  |
| 1/ Beginning of new runoff event. 2/ Runoff to 10:35p.                                                                                                                                             |                      |                    |                  |                      |                  |                                    |                 |                  |

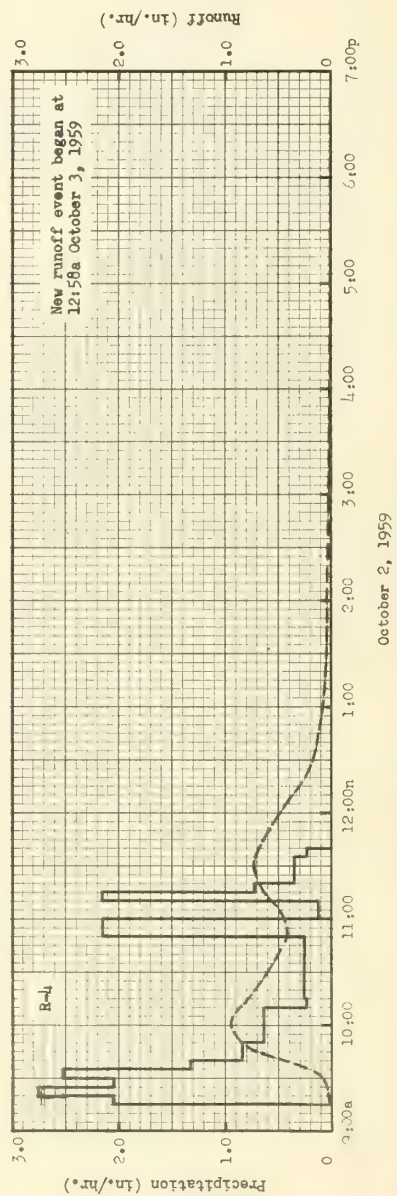
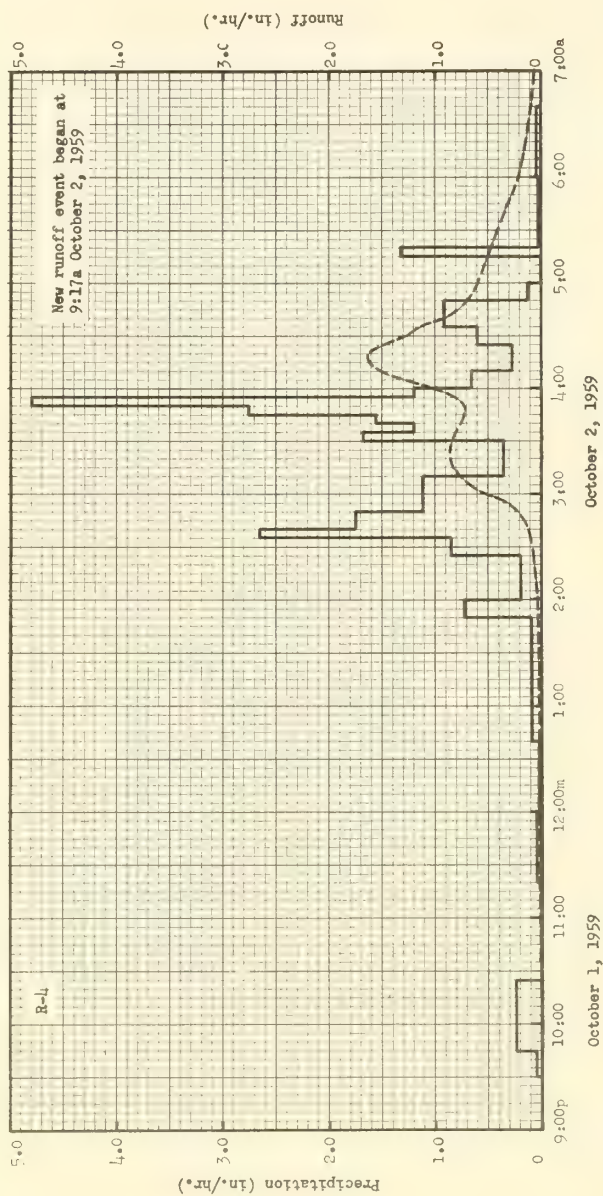


| SELECTED RUNOFF EVENTS                                                                                                                                                                                                       |                      |                    |                  |                      |                  | Stillwater, Oklahoma Watershed W-4 |                 |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                        |                      |                    | Rainfall         |                      |                  | Runoff                             |                 |                  |
| Date                                                                                                                                                                                                                         | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of October 1 and 2, 1959 - Continued                                                                                                                                                                                   |                      |                    |                  |                      |                  |                                    |                 |                  |
| 9-27-59                                                                                                                                                                                                                      | 0                    | .0041              | 2:00a            | .72                  | .43              | 2:59a                              | .497            | .1715            |
| 9-28                                                                                                                                                                                                                         | 0                    | .0001              | :25              | .19                  | .51              | 3:06                               | .689            | .2412            |
| 9-29                                                                                                                                                                                                                         | .13                  | 0                  | :35              | .84                  | .65              | :12                                | .794            | .3164            |
| 9-30                                                                                                                                                                                                                         | .63                  | .0389              | :40              | 2.64                 | .87              | :18                                | .847            | .3995            |
| 10-1                                                                                                                                                                                                                         | 1.011/               | .38182/            | :50              | 1.74                 | 1.16             | :24                                | .856            | .4848            |
| Watershed Conditions: 100% of the area was in native grass, most in pasture except for a small part in meadow. Good rains for past two years had helped recovery of range but heavy stocking kept it down to fair condition. |                      |                    | 3:10             | 1.11                 | 1.53             | :50                                | .724            | .8207            |
|                                                                                                                                                                                                                              |                      |                    | :30              | .36                  | 1.65             | :56                                | .833            | .8973            |
|                                                                                                                                                                                                                              |                      |                    | :35              | 1.68                 | 1.79             | 4:02                               | 1.103           | .9971            |
|                                                                                                                                                                                                                              |                      |                    | :40              | 1.20                 | 1.89             | :07                                | 1.378           | 1.1004           |
|                                                                                                                                                                                                                              |                      |                    | :45              | 1.56                 | 2.02             | :13                                | 1.594           | 1.2517           |
|                                                                                                                                                                                                                              |                      |                    | :50              | 2.76                 | 2.25             | :19                                | 1.633           | 1.4137           |
|                                                                                                                                                                                                                              |                      |                    | :55              | 4.80                 | 2.65             | :27                                | 1.403           | 1.6203           |
|                                                                                                                                                                                                                              |                      |                    | 4:00             | 1.20                 | 2.75             | :37                                | 1.066           | 1.8274           |
|                                                                                                                                                                                                                              |                      |                    | :10              | .66                  | 2.86             | :43                                | .8099           | 1.9214           |
|                                                                                                                                                                                                                              |                      |                    | :25              | .28                  | 2.93             | :56                                | .617            | 2.0748           |
|                                                                                                                                                                                                                              |                      |                    | :35              | .60                  | 2.96             | 5:30                               | .408            | 2.3729           |
|                                                                                                                                                                                                                              |                      |                    | :50              | .92                  | 3.19             | :58                                | .217            | 2.5134           |
|                                                                                                                                                                                                                              |                      |                    | 5:00             | .12                  | 3.21             | 6:30                               | .106            | 2.5953           |
|                                                                                                                                                                                                                              |                      |                    | :15              | 0                    | 3.21             | 7:19                               | .0531           | 2.6574           |
|                                                                                                                                                                                                                              |                      |                    | :20              | 1.32                 | 3.32             | 8:22                               | .0264           | 2.6969           |
|                                                                                                                                                                                                                              |                      |                    | 6:00             | .02                  | 3.33             | 9:10                               | .0166           | 2.7133           |
|                                                                                                                                                                                                                              |                      |                    | :40              | .03                  | 3.35             | 9:173/                             | .01663/         | 2.7152           |
| Event of October 2 and 3, 1959                                                                                                                                                                                               |                      |                    |                  |                      |                  |                                    |                 |                  |
| 9-1-59                                                                                                                                                                                                                       | 1.09                 | .0567              | 10-2-59          | Raingage             | R-4              | 10-2-59                            |                 |                  |
| 9-2                                                                                                                                                                                                                          | 0                    | .0015              | 9:15a            | 0                    | 0                | 9:17a                              | .0166           | 0                |
| 9-3                                                                                                                                                                                                                          | .41                  | .0033              | :20              | 2.04                 | .17              | :19                                | .0202           | .0006            |
| 9-4                                                                                                                                                                                                                          | 0                    | .0001              | :25              | 2.76                 | .40              | :23                                | .0299           | .0023            |
| 9-17                                                                                                                                                                                                                         | .06                  | 0                  | :30              | 2.04                 | .57              | :28                                | .0725           | .0061            |
| 9-23                                                                                                                                                                                                                         | .63                  | 0                  | :35              | 2.52                 | .78              | :33                                | .127            | .0144            |
| 9-24                                                                                                                                                                                                                         | 3.75                 | .5062              | :40              | 1.32                 | .89              | :38                                | .368            | .0332            |
| 9-25                                                                                                                                                                                                                         | 1.36                 | .3589              | :45              | .84                  | .96              | :43                                | .609            | .0765            |
| 9-26                                                                                                                                                                                                                         | 0                    | .0113              | :50              | .84                  | 1.03             | :50                                | .844            | .1644            |
| 9-27                                                                                                                                                                                                                         | 0                    | .0041              | 10:10            | .63                  | 1.24             | :57                                | .932            | .2651            |
| 9-28                                                                                                                                                                                                                         | 0                    | .0001              | :15              | .24                  | 1.26             | 10:00                              | .939            | .3118            |
| 9-29                                                                                                                                                                                                                         | .13                  | 0                  | :50              | .26                  | 1.41             | :03                                | .931            | .3586            |
| 9-30                                                                                                                                                                                                                         | .63                  | .0389              | 11:00            | 2.16                 | 1.77             | :12                                | .825            | .4908            |
| 10-1                                                                                                                                                                                                                         | 1.20                 | .4083              | :10              | .12                  | 1.79             | :22                                | .698            | .6183            |
| 10-2                                                                                                                                                                                                                         | 3.164/               | 2.68875/           | :15              | 2.16                 | 1.97             | :31                                | .591            | .7152            |
| Watershed Conditions: 100% of the area was in native grass, most in pasture except for a small part in meadow. Good rains for past two years had helped recovery of range but heavy stocking kept it down to fair condition. |                      |                    | :20              | .72                  | 2.03             | :45                                | .456            | .8365            |
|                                                                                                                                                                                                                              |                      |                    | :35              | .36                  | 2.12             | :55                                | .419            | .9079            |
|                                                                                                                                                                                                                              |                      |                    | :40              | .24                  | 2.14             | 11:09                              | .529            | 1.0150           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | :19                                | .680            | 1.1162           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | :31                                | .723            | 1.2586           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | :42                                | .666            | 1.3862           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | :53                                | .547            | 1.4981           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 12:05p                             | .426            | 1.5964           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | :16                                | .294            | 1.6620           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | :25                                | .203            | 1.6993           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | :47                                | .117            | 1.7557           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 1:19                               | .0635           | 1.8009           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 2:04                               | .0381           | 1.8375           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 3:10                               | .0205           | 1.8691           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 4:10                               | .0122           | 1.8849           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 5:36                               | .0071           | 1.8984           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 6:44                               | .0051           | 1.9054           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 8:10                               | .0038           | 1.9117           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 10:00                              | .0028           | 1.9178           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 12:00m                             | .0022           | 1.9227           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 10-3-59                            |                 |                  |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | 12:10a                             | .0021           | 1.9231           |
|                                                                                                                                                                                                                              |                      |                    |                  |                      |                  | :586/                              | .00196/         | 1.9247           |
| Notes: To convert runoff in in/hr to cfs, multiply by 207.72. 1/ Rain ended at 5:30p. 2/ Runoff to 10:35p. 3/ Beginning of new event. 4/ Rain ended at 6:40a. 5/ Runoff to 9:17a. 6/ Beginning of new event.                 |                      |                    |                  |                      |                  |                                    |                 |                  |



STILLWATER, OKLAHOMA WATERSHED W-4

STILLWATER, OKLAHOMA WATERSHED W-4





## WATERSHED CHARACTERISTICS

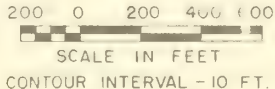
SIZE - 206 ACRES

COVER - NATIVE GRASS RANGE

| POND NO. | WATERSHED (ACRES) | SURFACE AREA (ACRES) | STORAGE CAPACITY (ACRE FT.) |
|----------|-------------------|----------------------|-----------------------------|
| 1.       | 22.9              | 1.37                 | 3.91                        |
| 2.       | 11.4              | 0.32                 | 0.40                        |
| 3.       | 6.7               | 0.48                 | 1.53                        |

## LEGEND

WATERSHED BOUNDARY -----  
POND WATERSHED BOUNDARY .....  
WATERWAY .....  
FENCE .....  
CONTOUR ..... 980



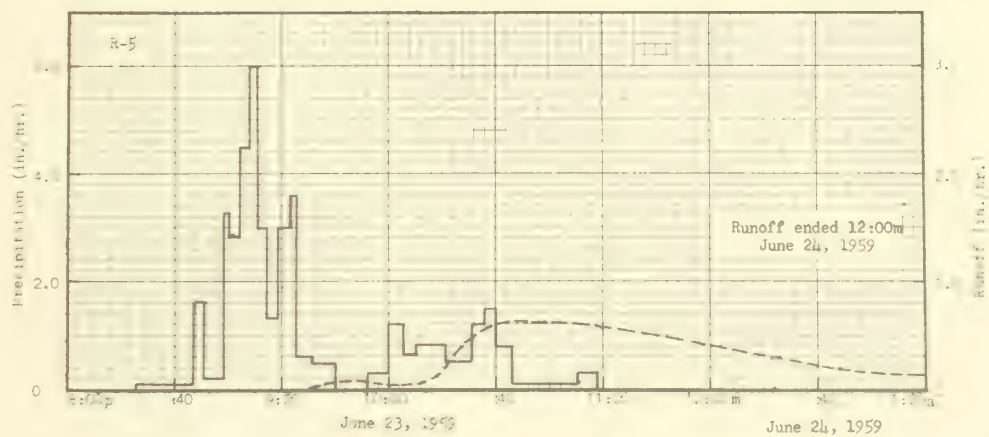
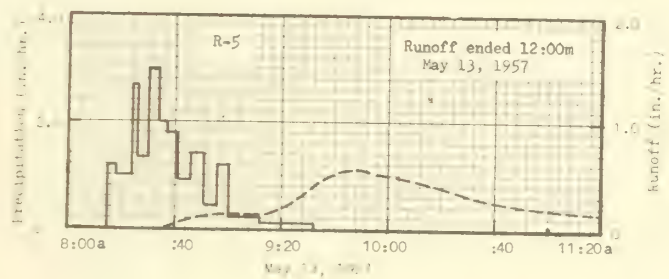
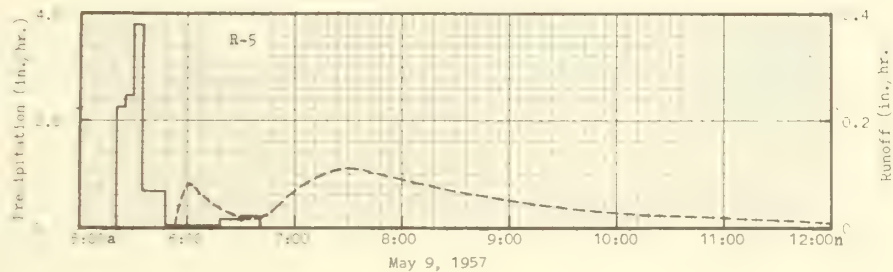
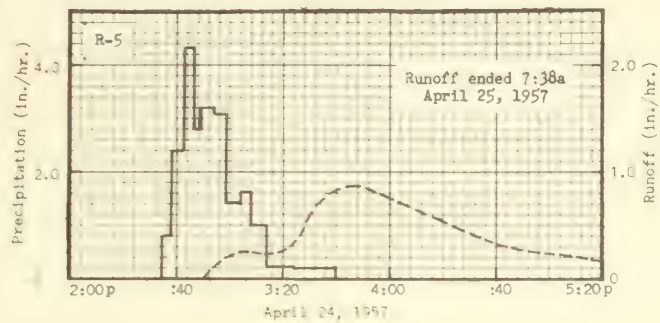


| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                        |                   |        |                                           |          |               |                       |         |                                  |          |               |              |      | Riesel (Waco), Texas Watershed C<br>(Area - 579 acres) |       |        |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------|-------------------------------------------|----------|---------------|-----------------------|---------|----------------------------------|----------|---------------|--------------|------|--------------------------------------------------------|-------|--------|--------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                    |                   | Jan.   | Feb.                                      | Mar.     | Apr.          | May                   | June    | July                             | Aug.     | Sept.         | Oct.         | Nov. | Dec.                                                   | Year  |        |        |
| 1956                                                                                                                                                                                                                                                                                                                                                             | P                 | 2.53   | 2.21                                      | 0.18     | 0.65          | 4.72                  | 1.25    | 6.64                             | 2.25     | 1.1           | 1.1          | 1.1  | 1.1                                                    | 21.04 |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  | Q                 | 0      | .16                                       | 0        | 0             | .46                   | 0       | 0                                | 0        | 0             | 0            | 0    | 0                                                      | 1.23  |        |        |
| 1957                                                                                                                                                                                                                                                                                                                                                             | P                 | 1.40   | 2.98                                      | 5.66     | 15.72         | 6.85                  | 1.72    | .04                              | 1.3      | 4.3           | 1.1          | 1.1  | 1.1                                                    | 51.93 |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  | Q                 | 0      | .15                                       | 1.62     | 10.04         | 3.70                  | T       | 0                                | 0        | 1.1           | 1.1          | T    | T                                                      | 17.01 |        |        |
| 1958                                                                                                                                                                                                                                                                                                                                                             | P                 | 2.05   | 3.22                                      | 1.35     | 3.08          | 2.04                  | 1.78    | 1.                               | 1.1      | 1.1           | 1.1          | 1.1  | 1.1                                                    | 31.96 |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  | Q                 | .05    | .72                                       | .01      | .03           | .41                   | 0       | 0                                | .20      | 1.1           | 1.1          | 1    | 1                                                      | 3.24  |        |        |
| 1959                                                                                                                                                                                                                                                                                                                                                             | P                 | .36    | 3.56                                      | .91      | 3.76          | 3.10                  | 8.06    | 3.66                             | 1.1      | 1.1           | 1.1          | 1.1  | 1.1                                                    | 42.19 |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  | Q                 | T      | .36                                       | T        | .22           | T                     | 1.73    | T                                | 0        | 0             | 0            | 0    | 0                                                      | 1.4   |        |        |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                          |                   |        |                                           |          |               |                       |         | Riesel (Waco), Texas Watershed C |          |               |              |      |                                                        |       |        |        |
| YEAR                                                                                                                                                                                                                                                                                                                                                             | MAXIMUM DISCHARGE |        | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |          |               |                       |         |                                  |          |               |              |      |                                                        |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        | 1 hour                                    |          | 2 hours       |                       | 6 hours |                                  | 12 hours |               | 1 day        |      | 2 days                                                 |       | 8 days |        |
|                                                                                                                                                                                                                                                                                                                                                                  | Date              | Rate   | Date                                      | Vol.     | Date          | Vol.                  | Date    | Vol.                             | Date     | Vol.          | Date         | Vol. | Date                                                   | Vol.  | Date   | Vol.   |
| 1957                                                                                                                                                                                                                                                                                                                                                             | 4-19              | e 1.33 | 4-19                                      | e 1.33   | 4-19          | e 2.02                | 4-23    | 2.80                             | 4-23     | 3.04          | 4-23         | 1.16 | 4-23                                                   | 4.54  | 4-19   | e 1.76 |
| 1958                                                                                                                                                                                                                                                                                                                                                             | 9-19              | .80    | 9-19                                      | .67      | 9-19          | .98                   | 9-19    | 1.27                             | 9-19     | 1.58          | 9-19         | 1.63 | 9-19                                                   | 1.56  | 9-19   | 1.75   |
| 1959                                                                                                                                                                                                                                                                                                                                                             | 6-23              | .62    | 6-23                                      | .59      | 6-23          | 1.00                  | 6-23    | 1.39                             | 10-4     | 1.73          | 10-4         | 1.86 | 10-4                                                   | 1.88  | 10-4   | 1.89   |
| Notes: Quality of records: monthly P and Q, good; Annual Max. discharges and volumes, good. Watershed conditions: no appreciable change in land use or conservation practices since 1955. See page 42.2-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, SWC, June 1957 (reprinted 1961).                        |                   |        |                                           |          |               |                       |         |                                  |          |               |              |      |                                                        |       |        |        |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                           |                   |        |                                           |          |               |                       |         | Riesel (Waco), Texas Watershed C |          |               |              |      |                                                        |       |        |        |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                            |                   |        |                                           | Rainfall |               |                       |         |                                  |          | Runoff        |              |      |                                                        |       |        |        |
| Date                                                                                                                                                                                                                                                                                                                                                             | Rainfall (inches) |        | Runoff (inches)                           |          | Date and time | Intensity (in/hr)     |         | Acc. (inches)                    |          | Date and time | Rate (in/hr) |      | Acc. (inches)                                          |       |        |        |
| Event of April 24, 25, 1957                                                                                                                                                                                                                                                                                                                                      |                   |        |                                           |          |               |                       |         |                                  |          |               |              |      |                                                        |       |        |        |
| 3-24, 26-57                                                                                                                                                                                                                                                                                                                                                      | 0                 |        | 0.0017                                    |          | 4-24-57       | Raingage              |         | 5                                |          | 4-24-57       |              |      |                                                        |       |        |        |
| 3-27                                                                                                                                                                                                                                                                                                                                                             | 1.18              |        | .4182                                     |          | 2:35p         | 0                     |         | 0                                |          | 2:38p         | 0.0007       |      | 0                                                      |       |        |        |
| 3-28, 30                                                                                                                                                                                                                                                                                                                                                         | 0                 |        | .0633                                     |          | :38           | .80                   |         | .04                              |          | :50           | .0044        |      | .0003                                                  |       |        |        |
| 3-31                                                                                                                                                                                                                                                                                                                                                             | 1.24              |        | .5282                                     |          | :42           | 2.40                  |         | .20                              |          | :52           | .0236        |      | .0007                                                  |       |        |        |
| 4-1, 2                                                                                                                                                                                                                                                                                                                                                           | 0                 |        | .0725                                     |          | :46           | 4.35                  |         | .49                              |          | :53           | .0603        |      | .014                                                   |       |        |        |
| 4-3                                                                                                                                                                                                                                                                                                                                                              | .13               |        | .0019                                     |          | :49           | 2.80                  |         | .63                              |          | :54           | .100         |      | .0027                                                  |       |        |        |
| 4-4                                                                                                                                                                                                                                                                                                                                                              | .13               |        | .0011                                     |          | :54           | 3.24                  |         | .90                              |          | :58           | .197         |      | .013                                                   |       |        |        |
| 4-5, 7                                                                                                                                                                                                                                                                                                                                                           |                   |        | .0137                                     |          | :59           | 3.12                  |         | 1.16                             |          | 3:04          | .252         |      | .0363                                                  |       |        |        |
| 4-8                                                                                                                                                                                                                                                                                                                                                              | .02               |        | .0001                                     |          | 3:04          | 1.44                  |         | 1.28                             |          | :07           | .252         |      | .0489                                                  |       |        |        |
| 4-9, 12                                                                                                                                                                                                                                                                                                                                                          | 0                 |        | T                                         |          | :08           | 1.65                  |         | 1.39                             |          | :14           | .244         |      | .0779                                                  |       |        |        |
| 4-13                                                                                                                                                                                                                                                                                                                                                             | .05               |        | T                                         |          | :14           | 1.00                  |         | 1.49                             |          | :16           | .244         |      | .0860                                                  |       |        |        |
| 4-14                                                                                                                                                                                                                                                                                                                                                             | 0                 |        | T                                         |          | :24           | .24                   |         | 1.53                             |          | :22           | .276         |      | .1121                                                  |       |        |        |
| 4-15                                                                                                                                                                                                                                                                                                                                                             | .06               |        | T                                         |          | :40           | .23                   |         | 1.59                             |          | :26           | .385         |      | .1337                                                  |       |        |        |
| 4-16, 18                                                                                                                                                                                                                                                                                                                                                         | 0                 |        | T                                         |          | Raingage      | 14                    |         | 1.79                             |          | :28           | .468         |      | .1479                                                  |       |        |        |
| 4-19                                                                                                                                                                                                                                                                                                                                                             | 5.68              |        | 2.2388                                    |          | Raingage      | 20                    |         | 1.62                             |          | :32           | .668         |      | .1856                                                  |       |        |        |
| 4-20                                                                                                                                                                                                                                                                                                                                                             | .34               |        | .7588                                     |          | Weighted      | Average <sup>2/</sup> |         | 1.64                             |          | :36           | .791         |      | .2344                                                  |       |        |        |
| 4-21                                                                                                                                                                                                                                                                                                                                                             | .36               |        | .1147                                     |          |               |                       |         |                                  |          | :43           | .863         |      | .3280                                                  |       |        |        |
| 4-22                                                                                                                                                                                                                                                                                                                                                             | .33               |        | .1145                                     |          |               |                       |         |                                  |          | :46           | .868         |      | .3713                                                  |       |        |        |
| 4-23                                                                                                                                                                                                                                                                                                                                                             | 3.71              |        | 3.0894                                    |          |               |                       |         |                                  |          | :51           | .844         |      | .4427                                                  |       |        |        |
| 4-24                                                                                                                                                                                                                                                                                                                                                             | .04               |        | .0199                                     |          |               |                       |         |                                  |          | 4:02          | .728         |      | .5878                                                  |       |        |        |
| Watershed Conditions: 41% of area in corn generally planted first of March; 12% bedded for cotton, no crop; 3% row grain sorghum planted first of April; 3% sorghum hay, broadcast first of April; 5% oats and oats-clover, oats in bloom stage; 5% broadcast sweet clover; 28% of pasture, including brushy and open; 3% farmsteads and gravel and paved roads. |                   |        |                                           |          |               |                       |         |                                  |          |               |              |      |                                                        |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | :14           | .590         |      | .1106                                                  |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | :25           | .474         |      | .0166                                                  |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | :38           | .365         |      | .9075                                                  |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | :52           | .276         |      | .3617                                                  |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | 5:07          | .211         |      | 1.0426                                                 |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | :17           | .183         |      | 1.0755                                                 |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | 6:02          | .102         |      | 1.1779                                                 |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | 7:02          | .0521        |      | 1.2512                                                 |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | 8:26          | .0247        |      | 1.3617                                                 |       |        |        |
|                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |         |                                  |          | 11:00         | .0098        |      | 1.3424                                                 |       |        |        |
| Notes: To convert runoff in in/hr to ft/s, multiply by 563.82. 1/ Prior to event beginning 2:35p. 2/ Thiessen method. For map of watershed, see page 42.4-6.                                                                                                                                                                                                     |                   |        |                                           |          |               |                       |         |                                  |          |               |              |      |                                                        |       |        |        |

| SELECTED RUNOFF EVENTS                                                                                                                                                    |                   |                 |               |                       |               | Riesel (Waco), Texas Watershed C |              |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-----------------------|---------------|----------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                     |                   |                 | Rainfall      |                       |               | Runoff                           |              |               |
| Date                                                                                                                                                                      | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                    | Rate (in/hr) | Acc. (inches) |
| Event of April 24-25, 1957 - Continued                                                                                                                                    |                   |                 |               |                       |               |                                  |              |               |
|                                                                                                                                                                           |                   |                 |               |                       |               | 4-24-57<br>12:00m                | .0074        | 1.3510        |
|                                                                                                                                                                           |                   |                 |               |                       |               | 4-25-57<br>2:44a                 | .0040        | 1.3660        |
|                                                                                                                                                                           |                   |                 |               |                       |               | 7:38                             | .0011        | 1.3796        |
| Event of May 9, 1957                                                                                                                                                      |                   |                 |               |                       |               |                                  |              |               |
| 4-14, 18                                                                                                                                                                  | C                 | T               | 5:20a         | 0                     | 0             | 5-9-57<br>5:49a                  | 0.0002       | 0             |
|                                                                                                                                                                           |                   |                 | :25           | 2.28                  | .19           |                                  | .0006        | .0001         |
|                                                                                                                                                                           | 5.68              | 2.2388          | :30           | 2.52                  | .40           |                                  | .0411        | .0005         |
|                                                                                                                                                                           | .34               | .7588           |               | 3.84                  | .72           | :56                              | .0538        | .0013         |
| 4-21                                                                                                                                                                      | .36               | .1147           | :48           | .69                   |               | :57                              | .0651        | .0022         |
| 4-22                                                                                                                                                                      | .33               | .1145           | 6:00          | .04                   | .89           | :00                              | .0800        | .0059         |
|                                                                                                                                                                           | 3.71              | 3.0894          |               | .18                   | .93           | :02                              | .0800        | .0086         |
|                                                                                                                                                                           | 1.70              | 1.4282          | :41           | .24                   | .97           | :12                              |              | .0200         |
| 4-25                                                                                                                                                                      |                   | .0445           | 1:58p         |                       | 1.07          | :30                              | .0219        | .0304         |
| 4-26                                                                                                                                                                      | 1.29              | .5630           | 2:03          | .96                   | 1.15          | :30                              | .0197        | .0324         |
|                                                                                                                                                                           | .21               | .4157           | :11           | .38                   | 1.20          | :38                              | .0197        | .0331         |
| 4-28                                                                                                                                                                      | 1.69              | .9864           | :16           | 1.65                  | 1.31          | :47                              | .0332        | .0368         |
| 4-29                                                                                                                                                                      | .02               | .1877           | :24           | .27                   | 1.35          | :58                              | .0665        | .0461         |
| 4-30                                                                                                                                                                      | T                 | .0116           | :31           | .43                   | 1.40          | :21                              | .1           | .0811         |
| 5-1                                                                                                                                                                       | .20               | .0034           | :51           | .06                   | 1.42          | :29                              | .112         | .0958         |
| 5-2                                                                                                                                                                       |                   | .0037           | Raingage      | 14                    | 1.32          | :33                              | .112         | .1033         |
| 5-3                                                                                                                                                                       | .83               | .3669           | Raingage      | 20                    | 1.23          | 8:04                             | .0932        | .1568         |
| 5-4, 8                                                                                                                                                                    |                   | .0276           | Weighted      |                       | 1.38          | :22                              | .0791        | .1826         |
|                                                                                                                                                                           | C                 | T               |               |                       |               | :56                              | .0558        | .2218         |
| Watershed Conditions: 41% corn; 12% grain sorghum; 24% grain sorghum; 3% broadcast grain sorghum; 5% oats and clover; 10% pasture; 2% farmsteads, gravel and paved roads. |                   |                 |               |                       |               | 9:50                             | .0339        | .2607         |
|                                                                                                                                                                           |                   |                 |               |                       |               | 10:25                            | .0231        | .2774         |
|                                                                                                                                                                           |                   |                 |               |                       |               | 11:21                            | .1           | .2950         |
|                                                                                                                                                                           |                   |                 |               |                       |               | :56                              | .0120        | .3030         |
|                                                                                                                                                                           |                   |                 |               |                       |               | 1:58p                            | .0059        | .3204         |
| Event of May 13, 1957                                                                                                                                                     |                   |                 |               |                       |               |                                  |              |               |
| 4-13-57                                                                                                                                                                   | 0.05              |                 | 5-13-57       |                       |               | 5-13-57                          |              |               |
| 4-14                                                                                                                                                                      | C                 | T               | 8:15a         | 0                     | 0             | 8:18a                            | 0.0003       | 0             |
| 4-15                                                                                                                                                                      | .06               |                 | :18           | 1.20                  | .06           | :31                              | .0005        | .0001         |
|                                                                                                                                                                           | C                 | T               | :26           | 1.00                  | .16           | :37                              | .0072        | .0002         |
|                                                                                                                                                                           | 5.68              | 2.2388          |               | 2.70                  | .25           | :40                              | .0572        | .0021         |
|                                                                                                                                                                           | .34               | .7588           | :30           | 1.35                  | .34           | :44                              | .0952        | .0073         |
| 4-21                                                                                                                                                                      | .36               | .1147           | :34           | 3.00                  | .54           | :48                              | .122         | .114          |
| 4-22                                                                                                                                                                      | .33               | .1145           | :37           | 2.00                  | .64           | :52                              | .115         | .0232         |
| 4-23                                                                                                                                                                      | 3.71              | 3.0894          | :41           | 1.80                  | .76           | :59                              | .11          | .0394         |
|                                                                                                                                                                           | 1.70              | 1.4282          |               | .96                   | .84           | 9:00                             | .13          | .0596         |
| 4-25                                                                                                                                                                      | C                 | .0445           | :51           | 1.44                  | .96           | :11                              | .130         | .0661         |
|                                                                                                                                                                           | 1.29              | .5630           | :00           | .48                   | 1.00          | :19                              | .163         | .0853         |
| 4-27                                                                                                                                                                      | .21               | .4157           | :00           | 1.20                  | 1.08          | :25                              | .248         | .1054         |
| 4-28                                                                                                                                                                      | 1.69              | .9864           | :16           | .26                   | 1.15          | :31                              | .388         | .115          |
|                                                                                                                                                                           |                   | .1877           | :32           | .15                   | 1.19          | :38                              | .504         | .1893         |
| 5-1                                                                                                                                                                       | T                 | .0116           | :43           | .27                   | 1.24          | :47                              | .566         | .2704         |
| 5-2                                                                                                                                                                       | .20               | .0034           | :51           | .28                   | 1.30          | :50                              | .566         | .2986         |
| 5-3                                                                                                                                                                       |                   | .0037           | 10:10         | .17                   | 1.34          | 10:06                            | .489         | .4410         |
| 5-4                                                                                                                                                                       | .83               | .3669           | :30           | .12                   | 1.38          | :14                              | .430         | .5024         |
| 5-5                                                                                                                                                                       | C                 | .0276           | Raingage      | 14                    | 1.32          | :29                              | .324         | .1            |
|                                                                                                                                                                           | 1.41              | .5365           | Raingage      | 20                    | 1.34          | :40                              | .25          | .6640         |
|                                                                                                                                                                           |                   | .0257           | Weighted      | Average <sup>2/</sup> | 1.36          | 11:01                            | .192         | .7301         |
| 5-11                                                                                                                                                                      | 2.42              | 1.3983          |               |                       |               | :13                              | .166         | .7659         |
|                                                                                                                                                                           | C                 | T               |               |                       |               | 1:11p                            | .0932        | .8866         |
|                                                                                                                                                                           |                   |                 |               |                       |               | :17                              | .0471        |               |
| Watershed Conditions: 41% corn; 12% grain sorghum; 24% grain sorghum; 3% broadcast grain sorghum; 5% oats and clover; 10% pasture; 2% farmsteads, gravel and paved roads. |                   |                 |               |                       |               | 2:31                             | .0219        | .9992         |
|                                                                                                                                                                           |                   |                 |               |                       |               | 4:51                             | .0085        | 1.0320        |
|                                                                                                                                                                           |                   |                 |               |                       |               | 8:45                             | .0030        |               |
|                                                                                                                                                                           |                   |                 |               |                       |               | 9:00m                            | .0018        | 1.0596        |
| Notes: <sup>1/</sup> To convert runoff in inches to feet, multiply by 583.02. <sup>2/</sup> Runoff prior to 5:49a. <sup>3/</sup> Table method.                            |                   |                 |               |                       |               |                                  |              |               |
| Runoff prior to 5:49a.                                                                                                                                                    |                   |                 |               |                       |               |                                  |              |               |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                  |                       |                  | Riesel (Waco), Texas Watershed C |                 |                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|-----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                       |                      |                    | Rainfall         |                       |                  | Runoff                           |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                                                        | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr)  | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                                                                                                                                                  |                      |                    |                  |                       |                  |                                  |                 |                  |
| 5-23-59                                                                                                                                                                                                                                                                                                                                                                                     | 0.25                 | 0.0002             | 6-23-59          | Raingage              | 5                | 6-23-59                          |                 |                  |
| 5-24                                                                                                                                                                                                                                                                                                                                                                                        | .04                  | .0001              | 8:25p            | 0                     | 0                | 9:06p                            | 0.0002          | 0                |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                        | .07                  | T                  | :47              | .14                   | .05              | :14                              | .0012           | .0001            |
| 5-26, 31                                                                                                                                                                                                                                                                                                                                                                                    | 0                    | T                  | :51              | 1.65                  | .16              | :30                              | .0083           | .0010            |
| 6-2                                                                                                                                                                                                                                                                                                                                                                                         | .26                  | T                  | :58              | .26                   | .19              | :34                              | .0466           | .0026            |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                         | .01                  | T                  | 9:00             | 3.30                  | .30              | :37                              | .0685           | .0055            |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                         | 1.13                 | .0004              | :04              | 2.85                  | .49              | :36                              | .0817           | .0080            |
| 6-5                                                                                                                                                                                                                                                                                                                                                                                         | .95                  | .1083              | :08              | 4.50                  | .79              | :43                              | .0853           | .0136            |
| 6-6, 11                                                                                                                                                                                                                                                                                                                                                                                     | 0                    | .0177              | :11              | 6.00                  | 1.09             | :49                              | .0783           | .0218            |
| 6-12                                                                                                                                                                                                                                                                                                                                                                                        | .29                  | T                  | :15              | 3.00                  | 1.29             | :57                              | .0658           | .0314            |
| 6-13, 14                                                                                                                                                                                                                                                                                                                                                                                    | 0                    | T                  | :19              | 1.35                  | 1.38             | 10:03                            | .0553           | .0374            |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                        | .98                  | .0001              | :23              | 3.00                  | 1.58             | :16                              | .0961           | .0506            |
| 6-21                                                                                                                                                                                                                                                                                                                                                                                        | 0                    | T                  | :25              | 3.60                  | 1.70             | :20                              | .170            | .0596            |
| 6-22                                                                                                                                                                                                                                                                                                                                                                                        | 1.08                 | .0070              | :31              | .60                   | 1.76             | :23                              | .276            | .0706            |
| 6-23 <sup>1/</sup>                                                                                                                                                                                                                                                                                                                                                                          | 0                    | .0036              | :40              | .53                   | 1.84             | :24                              | .426            | .1054            |
| Watershed Conditions: 22% of area in corn, grain in dough stage; 7% cotton, beginning to bloom; 13% row grain sorghum, grain in dough stage; 4% broadcast grain sorghum in bloom stage; 11% wheat, oats and oats-clover; wheat and oats harvested; 8% sudan; 23% pasture, all classes; 9% idle crop land, annual and perennial forbs and grasses; 3% farmsteads and gravel and paved roads. |                      |                    | :52              | 0                     | 1.84             | :35                              | .546            | .1550            |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | 10:00            | .30                   | 1.88             | :45                              | .610            | .2514            |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :05              | 1.20                  | 1.98             | :53                              | .625            | .3737            |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :14              | .67                   | 2.08             | 11:07                            | .610            | .4778            |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :21              | .87                   | 2.18             | :29                              | .546            | .6897            |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :31              | .54                   | 2.27             | :43                              | .485            | .8100            |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :36              | 1.20                  | 2.37             | 12:00m                           | .406            | .9362            |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :40              | 1.50                  | 2.47             | 6-24-59                          |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :46              | .80                   | 2.55             | 12:17a                           | .310            | 1.0380           |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | 11:11            | .14                   | 2.61             | :35                              | .228            | 1.1182           |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :18              | .34                   | 2.65             | :55                              | .170            | 1.1842           |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | Raingage         | 14                    | 2.46             | 2:00                             | .0817           | 1.3134           |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | Raingage         | 20                    | 2.84             | 3:05                             | .0406           | 1.3766           |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | Weighted         | Average <sup>2/</sup> | 2.60             | 4:40                             | .0188           | 1.4198           |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                  |                       |                  | 7:19                             | .0089           | 1.4549           |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                  |                       |                  | 12:10p                           | .0036           | 1.4828           |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                  |                       |                  | 4:32                             | .0018           | 1.4941           |
|                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                  |                       |                  | 12:00m                           | .0007           | 1.5029           |

Notes: <sup>1/</sup> Invert runoff as shown to 10, multiply by 0.82. <sup>2/</sup> Runoff prior to 9:06p. <sup>3/</sup> Triessen method.



WATER RESOURCES DIVISION



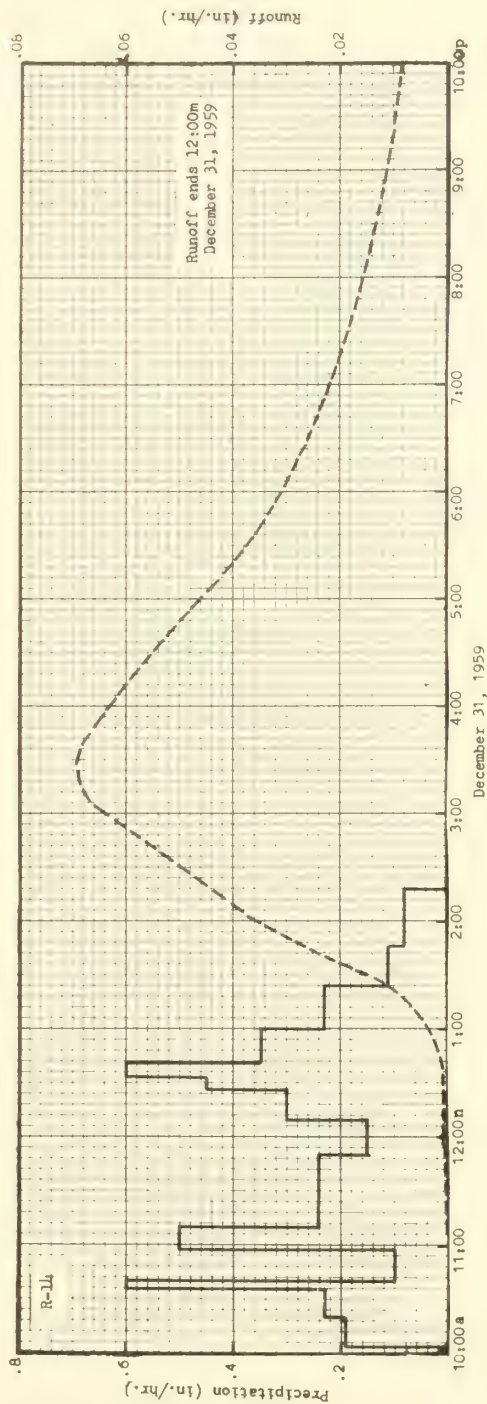
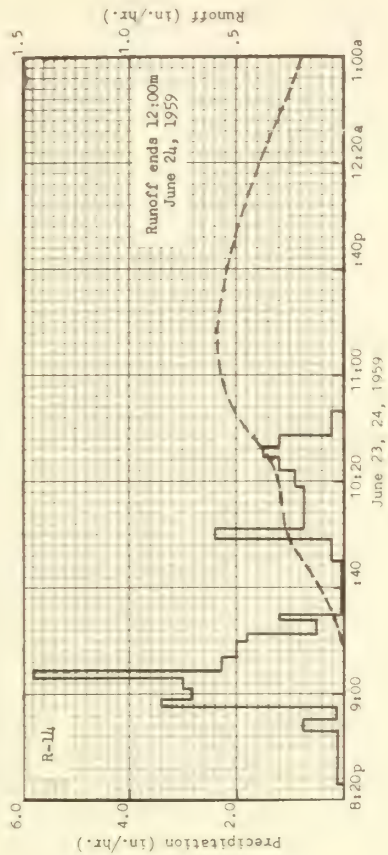
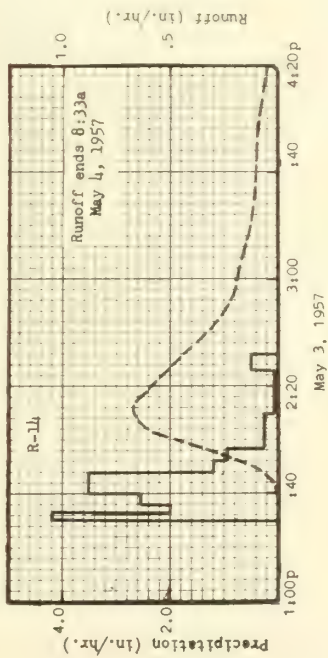
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                               |                   |        |                                           |          |               |                       |               | Riesel (Waco), Texas Watershed D<br>Area - 1110 acres (1.734 sq. mi.) |              |        |               |        |        |        |        |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------|-------------------------------------------|----------|---------------|-----------------------|---------------|-----------------------------------------------------------------------|--------------|--------|---------------|--------|--------|--------|--------|--------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                           | Jan.              | Feb.   | Mar.                                      | Apr.     | May           | June                  | July          | Aug.                                                                  | Sept.        | Oct.   | Nov.          | Dec.   | Year   |        |        |        |
| 1956 P                                                                                                                                                                                                                                                                                                                                                                                                  | 2.60              | 2.24   | 0.20                                      | 0.63     | 4.52          | 1.18                  | 0.60          | 2.45                                                                  | 0            | 0.73   | 4.27          | 2.02   | 21.44  |        |        |        |
| Q                                                                                                                                                                                                                                                                                                                                                                                                       | 0                 | .10    | 0                                         | 0        | .35           | 0                     | 0             | T                                                                     | 0            | 0      | .47           | T      | .92    |        |        |        |
| 1957 P                                                                                                                                                                                                                                                                                                                                                                                                  | 1.35              | 2.93   | 5.49                                      | 15.58    | 6.97          | 1.75                  | .04           | .32                                                                   | 4.22         | 8.03   | 4.29          | .82    | 51.79  |        |        |        |
| Q                                                                                                                                                                                                                                                                                                                                                                                                       | 0                 | .08    | 1.33                                      | 11.05    | 5.12          | .02                   | 0             | 0                                                                     | 0            | 2.21   | .57           | T      | 20.38  |        |        |        |
| 1958 P                                                                                                                                                                                                                                                                                                                                                                                                  | 2.04              | 3.20   | 1.37                                      | 3.04     | 2.06          | 1.80                  | 1.16          | 5.91                                                                  | 6.62         | 2.60   | 1.49          | 1.28   | 32.57  |        |        |        |
| Q                                                                                                                                                                                                                                                                                                                                                                                                       | .05               | .71    | .01                                       | .03      | .44           | 0                     | 0             | e .49                                                                 | e 1.92       | .10    | T             | T      | e 3.80 |        |        |        |
| 1959 P                                                                                                                                                                                                                                                                                                                                                                                                  | .35               | 3.58   | .97                                       | 3.77     | 3.23          | 7.84                  | 3.64          | 3.56                                                                  | 2.56         | 6.84   | 1.82          | 3.72   | 41.88  |        |        |        |
| Q                                                                                                                                                                                                                                                                                                                                                                                                       | C                 | .44    | .02                                       | .30      | T             | 1.93                  | .01           | T                                                                     | T            | 1.86   | .33           | .73    | 5.62   |        |        |        |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                 |                   |        |                                           |          |               |                       |               | Riesel (Waco), Texas Watershed D                                      |              |        |               |        |        |        |        |        |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                    | MAXIMUM DISCHARGE |        | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |          |               |                       |               |                                                                       |              |        |               |        |        |        |        |        |
|                                                                                                                                                                                                                                                                                                                                                                                                         |                   |        | 1 hour                                    |          | 2 hours       |                       | 6 hours       |                                                                       | 12 hours     |        | 1 day         |        | 2 days |        | 8 days |        |
|                                                                                                                                                                                                                                                                                                                                                                                                         | Date              | Rate   | Date                                      | Vol.     | Date          | Vol.                  | Date          | Vol.                                                                  | Date         | Vol.   | Date          | Vol.   | Date   | Vol.   | Date   | Vol.   |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                    | 4-19              | e 1.03 | 4-19                                      | e 0.90   | 4-19          | e 1.77                | 4-23          | 3.43                                                                  | 4-23         | 3.54   | 4-23          | 3.72   | 4-23   | 5.42   | 4-19   | e 9.66 |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                    | 9-19              | e .49  | 9-19                                      | e .46    | 9-19          | e .81                 | 9-19          | e 1.31                                                                | 9-19         | e 1.66 | 9-19          | e 1.72 | 9-19   | e 1.73 | 9-19   | e 1.91 |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                    | 6-23              | .60    | 6-23                                      | .57      | 6-23          | 1.03                  | 6-23          | 1.58                                                                  | 6-23         | 1.67   | 10-4          | 1.71   | 10-4   | 1.72   | 6-22   | 1.82   |
| Notes: Quality of records: monthly P, good; monthly Q, good except Aug., Sept. 1958, fair; Annual Max. discharges and volumes, good except 1957-58, fair. Watershed conditions: no appreciable change in land use or conservation practices since 1955. See page 42.3-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, SWC, June 1957 (reprinted 1961). |                   |        |                                           |          |               |                       |               |                                                                       |              |        |               |        |        |        |        |        |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |               | Riesel (Waco), Texas Watershed D                                      |              |        |               |        |        |        |        |        |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                   |                   |        |                                           | Rainfall |               |                       |               | Runoff                                                                |              |        |               |        |        |        |        |        |
| Date                                                                                                                                                                                                                                                                                                                                                                                                    | Rainfall (inches) |        | Runoff (inches)                           |          | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                                                         | Rate (in/hr) |        | Acc. (inches) |        |        |        |        |        |
| Event of May 3-4, 1957                                                                                                                                                                                                                                                                                                                                                                                  |                   |        |                                           |          |               |                       |               |                                                                       |              |        |               |        |        |        |        |        |
| 4-3-57                                                                                                                                                                                                                                                                                                                                                                                                  | 0.14              |        | 0.0012                                    |          | 5-3-57        | Raingage              | 14            | 5-3-57                                                                |              |        |               |        |        |        |        |        |
| 4-4                                                                                                                                                                                                                                                                                                                                                                                                     | .12               |        | .0013                                     |          | 1:30p         | 0                     | 0             | 1:29p                                                                 | 0.0008       |        | 0             |        |        |        |        |        |
| 4-5, 7                                                                                                                                                                                                                                                                                                                                                                                                  | 0                 |        | .0058                                     |          | :33           | 4.20                  | .21           | :37                                                                   | .0031        |        | .0002         |        |        |        |        |        |
| 4-8                                                                                                                                                                                                                                                                                                                                                                                                     | .02               |        | T                                         |          | :36           | 2.00                  | .31           | :40                                                                   | .0069        |        | .0004         |        |        |        |        |        |
| 4-13                                                                                                                                                                                                                                                                                                                                                                                                    | .05               |        | 0                                         |          | :40           | 2.55                  | .48           | :42                                                                   | .0148        |        | .0008         |        |        |        |        |        |
| 4-15                                                                                                                                                                                                                                                                                                                                                                                                    | .05               |        | 0                                         |          | :48           | 3.75                  | .98           | :44                                                                   | .0330        |        | .0016         |        |        |        |        |        |
| 4-19                                                                                                                                                                                                                                                                                                                                                                                                    | 5.60              |        | 2.1179                                    |          | :52           | 1.20                  | 1.06          | :48                                                                   | .0631        |        | .0047         |        |        |        |        |        |
| 4-20                                                                                                                                                                                                                                                                                                                                                                                                    | .33               |        | .7455                                     |          | :57           | .96                   | 1.14          | :50                                                                   | .107         |        | .0075         |        |        |        |        |        |
| 4-21                                                                                                                                                                                                                                                                                                                                                                                                    | .38               |        | .1172                                     |          | 2:10          | .28                   | 1.20          | :52                                                                   | .155         |        | .0119         |        |        |        |        |        |
| 4-22                                                                                                                                                                                                                                                                                                                                                                                                    | .33               |        | .1111                                     |          | :26           | .08                   | 1.22          | :56                                                                   | .276         |        | .0261         |        |        |        |        |        |
| 4-23                                                                                                                                                                                                                                                                                                                                                                                                    | 3.65              |        | 3.7184                                    |          | :32           | .50                   | 1.27          | :58                                                                   | .371         |        | .0370         |        |        |        |        |        |
| 4-24                                                                                                                                                                                                                                                                                                                                                                                                    | 1.72              |        | 1.6849                                    |          | Raingage      | 5                     | .21           | 2:00                                                                  | .469         |        | .0510         |        |        |        |        |        |
| 4-25                                                                                                                                                                                                                                                                                                                                                                                                    | 0                 |        | .0383                                     |          | Raingage      | 20                    | 1.14          | :05                                                                   | .618         |        | .0969         |        |        |        |        |        |
| 4-26                                                                                                                                                                                                                                                                                                                                                                                                    | 1.31              |        | .7439                                     |          | Weighted      | Average <sup>2/</sup> | .55           | :11                                                                   | .670         |        | .1610         |        |        |        |        |        |
| 4-27                                                                                                                                                                                                                                                                                                                                                                                                    | .21               |        | .3884                                     |          |               |                       |               | :15                                                                   | .646         |        | .2047         |        |        |        |        |        |
| 4-28                                                                                                                                                                                                                                                                                                                                                                                                    | 1.64              |        | 1.1609                                    |          |               |                       |               | :25                                                                   | .542         |        | .3041         |        |        |        |        |        |
| 4-29                                                                                                                                                                                                                                                                                                                                                                                                    | .03               |        | .1521                                     |          |               |                       |               | :35                                                                   | .405         |        | .3831         |        |        |        |        |        |
| 4-30                                                                                                                                                                                                                                                                                                                                                                                                    | T                 |        | .0058                                     |          |               |                       |               | :45                                                                   | .276         |        | .4394         |        |        |        |        |        |
| 5-1                                                                                                                                                                                                                                                                                                                                                                                                     | .19               |        | .0023                                     |          |               |                       |               | :50                                                                   | .238         |        | .4607         |        |        |        |        |        |
| 5-2                                                                                                                                                                                                                                                                                                                                                                                                     | 0                 |        | .0022                                     |          |               |                       |               | :55                                                                   | .205         |        | .4791         |        |        |        |        |        |
| 5-3 <sup>1/</sup>                                                                                                                                                                                                                                                                                                                                                                                       | .19               |        | .0113                                     |          |               |                       |               | 3:03                                                                  | .175         |        | .5043         |        |        |        |        |        |
| Watershed Conditions: 34% of area in corn, planted generally first of March; 16% bedded for cotton, no crop; 9% row grain sorghum, planted first of April; 4% broadcast grain sorghum, planted first of April; 3% oats and oats-clover, oats in bloom or milk stage; 7% sweet clover; 24% pasture, open and brushy; 3% farmsteads and gravel and paved roads.                                           |                   |        |                                           |          |               |                       |               |                                                                       |              |        |               |        |        |        |        |        |
|                                                                                                                                                                                                                                                                                                                                                                                                         |                   |        |                                           |          |               |                       |               |                                                                       |              |        |               |        |        |        |        |        |
|                                                                                                                                                                                                                                                                                                                                                                                                         |                   |        |                                           |          |               |                       |               |                                                                       |              |        |               |        |        |        |        |        |
| Notes: To convert runoff in in/hr to cfs, multiply by 1119.25. <sup>1/</sup> Prior to event beginning 1:30p. <sup>2/</sup> Thiessen method. For map of watershed, see page 42.4-6.                                                                                                                                                                                                                      |                   |        |                                           |          |               |                       |               |                                                                       |              |        |               |        |        |        |        |        |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                      |                   |                 |               |                   |               | Riesel (Waco), Texas Watershed D |                 |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-------------------|---------------|----------------------------------|-----------------|-----------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                       |                   |                 | Rainfall      |                   |               | Runoff                           |                 |                 |
| Date                                                                                                                                                                                                                                                                                                                                                                        | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                    | Rate (in/hr)    | Acc. (inches)   |
| Event of May 3-4, 1957 - Continued                                                                                                                                                                                                                                                                                                                                          |                   |                 |               |                   |               |                                  |                 |                 |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 5-4-57<br>3:57a<br>8:33          | 0.0016<br>.0009 | 0.7669<br>.7725 |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                                                                                                                                  |                   |                 |               |                   |               |                                  |                 |                 |
| 5-23-59                                                                                                                                                                                                                                                                                                                                                                     | 0.30              | 0.0002          | 6-23-59       | Raingage          | 14            | 6-23-59                          |                 |                 |
| 5-24                                                                                                                                                                                                                                                                                                                                                                        | .04               | T               | 8:26p         | 0                 | 0             | 9:02p                            | 0.0002          | 0               |
| 5-25                                                                                                                                                                                                                                                                                                                                                                        | .11               | T               | :46           | .12               | .04           | :07                              | .0006           | 0               |
| 5-26                                                                                                                                                                                                                                                                                                                                                                        |                   | T               | :             |                   | .09           | :13                              |                 | .0002           |
| 5-27                                                                                                                                                                                                                                                                                                                                                                        | .0                | T               | :55           | .12               | .10           | :17                              | .0044           | .0003           |
| 6-3                                                                                                                                                                                                                                                                                                                                                                         | .01               | T               | :58           | 3.40              | .27           | :19                              | .0083           | .0005           |
| 6-4                                                                                                                                                                                                                                                                                                                                                                         | 1.12              | .0059           | 9:02          | 2.85              | .46           | :22                              | .11             | .0011           |
| 6-5                                                                                                                                                                                                                                                                                                                                                                         | .82               | .0880           | :06           | 3.00              | .66           | :26                              | .0314           | .0027           |
| 6-6, 10                                                                                                                                                                                                                                                                                                                                                                     | 0                 |                 | :09           | 5.80              | .95           | :30                              | .0466           | .0053           |
| 6-12                                                                                                                                                                                                                                                                                                                                                                        | .27               | T               | :14           | 2.28              | 1.14          | :44                              | .0704           | .0090           |
| 6-13                                                                                                                                                                                                                                                                                                                                                                        |                   | T               | :20           | 2.00              | 1.34          | :41                              | .113            | .0199           |
| 6-22                                                                                                                                                                                                                                                                                                                                                                        | .98               | .0072           | :28           | 1.80              | 1.43          | :47                              | .154            | .0332           |
| 6-23                                                                                                                                                                                                                                                                                                                                                                        | .02               | .0027           | :38           | 1.46              | 1.47          | :52                              | .204            | .0479           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :48           | 1.20              | 1.51          | :59                              | .269            | .0762           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :58           | .06               | 1.53          | 10:10                            | .294            | .1566           |
| Watershed Description: 10% corn, 10% sorghum, 10% cotton, beginning to bloom; 10% grain sorghum, grain in bloom stage; 20% dormant grain sorghum, grain in bloom stage; 10% Sudan; 14% wheat, oats and oats-clover, stubble, grain harvested; 13% idle crop land, annual and perennial forbs and grasses 30% pasture, all wooded; 2% farmsteads and gravel and paved roads. |                   |                 | :58           | .23               | 1.56          | :28                              | .350            | .2199           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :02           | 2.40              | 1.72          | :35                              | .418            | .2644           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :18           | .75               | 1.92          | :42                              | .487            | .3172           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :24           | .90               | 2.01          | 11:09                            | .598            | .5676           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :29           | 1.20              | 2.11          | :12                              | .604            | .5975           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :33           | 1.50              | 2.21          | :18                              | .604            | .6576           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :37           | 1.20              | 2.29          | :33                              | .580            | .8049           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :46           | .27               | 2.33          | :40                              | .541            | .9258           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :58           | .20               | 2.37          | 12:00m                           | .487            | 1.0456          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | 11:09         | .16               | 2.40          | 6-24-59                          |                 |                 |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | :15           | .40               | 2.44          | 12:18a                           | .418            | 1.1813          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | 12:00m        | .01               | 2.45          | :30                              | .354            | 1.2582          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | Raingage      | 2.69              | 2.69          | :40                              | .266            | 1.3398          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | Raingage      | 20                | 2.8           | :58                              | .213            | 1.3878          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | Raingage      | 26A               | 3.02          | 1:10                             | .144            | 1.4400          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | Weighted      | Average           | 2.64          | :37                              | .104            | 1.4830          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 2:21                             | .0606           | 1.5409          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 3:16                             | .0381           | 1.5846          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 4:25                             | .0216           | 1.6184          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 5:01                             | .0110           | 1.6299          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | :12                              | .0173           | 1.6330          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | :17                              | .0173           | 1.6345          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | :51                              | .0141           | 1.6433          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | :31                              | .0116           | 1.6518          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 9:21                             | .0056           | 1.6748          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 12:11p                           | .0031           | 1.6868          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 6:29                             | .11             | 1.6988          |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 12:00m                           | .0006           | 1.7034          |
| Event of December 31, 1959                                                                                                                                                                                                                                                                                                                                                  |                   |                 |               |                   |               |                                  |                 |                 |
| 12-10-59                                                                                                                                                                                                                                                                                                                                                                    | 0.10              | 0               | 12-31-59      | Raingage          | 14            | 12-31-59                         |                 |                 |
| 12-11                                                                                                                                                                                                                                                                                                                                                                       | .68               | .0011           | 10:40         | 0                 | 0             | 12:00a                           | T               | 0               |
| 12-12, 14                                                                                                                                                                                                                                                                                                                                                                   |                   | .0006           | :20           | .19               | .05           | 10:07                            | T               | .0001           |
| 12-15                                                                                                                                                                                                                                                                                                                                                                       | 1.34              | .2811           | :36           | .23               | .11           | 11:07                            | .0001           | .0001           |
| 12-16                                                                                                                                                                                                                                                                                                                                                                       |                   | .0659           | :40           | .60               | .15           | :33                              | .0004           | .0002           |
| 12-17                                                                                                                                                                                                                                                                                                                                                                       | .21               | .0286           | :58           | .10               | .18           | 12:37p                           | .0012           | .0010           |
| 12-18, 22                                                                                                                                                                                                                                                                                                                                                                   | 0                 | .0285           | 11:10         | .50               | .28           | :57                              | .0030           | .0017           |
| 12-23                                                                                                                                                                                                                                                                                                                                                                       | .01               | .0012           | :50           | .24               | .44           | 1:13                             | .0062           | .0029           |
| 12-24, 26                                                                                                                                                                                                                                                                                                                                                                   |                   | .0028           | 12:10p        | .15               | .49           | :25                              | .0112           | .0046           |
| 12-27                                                                                                                                                                                                                                                                                                                                                                       | .18               | .0028           | :20           | .30               | .57           | :43                              | .0248           | .0097           |
| 12-28, 31                                                                                                                                                                                                                                                                                                                                                                   | 0                 | .11             | :34           | .45               | .63           | 2:03                             | .0376           | .0203           |
| 12-31                                                                                                                                                                                                                                                                                                                                                                       | .05               | .0001           | :41           | .60               | .71           | :47                              | .0581           | .0548           |
|                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | 1:00          | .35               | .81           | 3:00                             | .0664           | .0734           |

Notes: To convert runoff in in. or to cfs, multiply by 1.11925. 1/ Prior to event beginning 3:26p. 2/ Thiessen method. 3/ Prior to event beginning 10:04a.

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                   |                      |                    |                  |                       | Riesel (Waco), Texas |                  | Watershed D     |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|-----------------------|----------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                    |                      |                    | Rainfall         |                       |                      | Runoff           |                 |                  |
| Date                                                                                                                                                                                                                                                     | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr)  | Acc.<br>(inches)     | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of December 31, 1959 - Continued                                                                                                                                                                                                                   |                      |                    |                  |                       |                      |                  |                 |                  |
| Watershed Conditions: 6% oats and wheat, fall seeded; 22% bedded or plowed, no crop; 48% annual and perennial forbs and grasses, dormant; 21% pasture, all classes, generally dormant but some winter annuals; 3% farmsteads and gravel and paved roads. |                      |                    | 12-31-59         | Raingage              | 14                   | 12-31-59         |                 |                  |
|                                                                                                                                                                                                                                                          |                      |                    | 1:24p            | 0.23                  | 0.90                 | 3:25p            | 0.0697          | 0.0960           |
|                                                                                                                                                                                                                                                          |                      |                    | :46              | .11                   | .94                  | :39              | .0686           | .1121            |
|                                                                                                                                                                                                                                                          |                      |                    | 2:18             | .08                   | 1.00                 | 4:27             | .0560           | .1619            |
|                                                                                                                                                                                                                                                          |                      |                    | Raingage         | 5                     | 1.03                 | 5:29             | .0376           | .2103            |
|                                                                                                                                                                                                                                                          |                      |                    | Raingage         | 20                    | 1.09                 | 6:43             | .0248           | .2490            |
|                                                                                                                                                                                                                                                          |                      |                    | Raingage         | 26A                   | 1.09                 | 7:25             | .0188           | .2642            |
|                                                                                                                                                                                                                                                          |                      |                    | Weighted         | Average <sup>1/</sup> | 1.04                 | 8:13             | .0144           | .2774            |
|                                                                                                                                                                                                                                                          |                      |                    |                  |                       |                      | 9:07             | .0112           | .2889            |
|                                                                                                                                                                                                                                                          |                      |                    |                  |                       |                      | 10:17            | .0085           | .3004            |
|                                                                                                                                                                                                                                                          |                      |                    |                  |                       |                      | 12:00m           | .0059           | .3125            |
| Notes: To convert runoff in in/hr to cfs, multiply by 1119.25. <sup>1/</sup> Thiessen method.                                                                                                                                                            |                      |                    |                  |                       |                      |                  |                 |                  |

RIESEL (WACO), TEXAS WATERSHED D





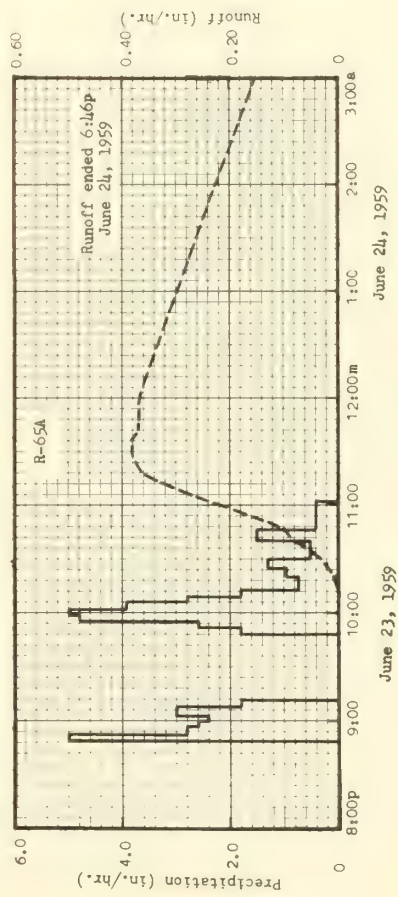
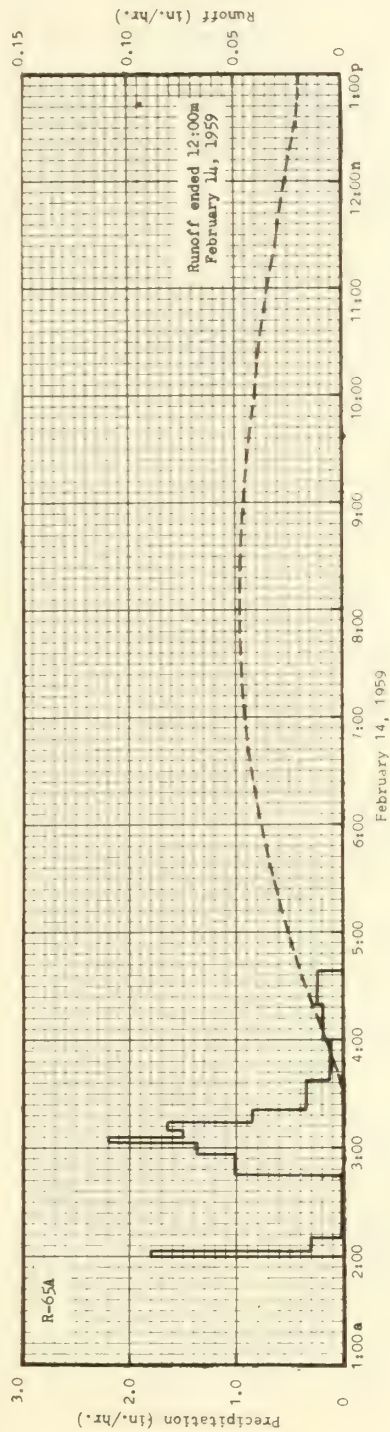
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                       |                   |      |                                           |          |               |                   |                       | Riesel (Waco), Texas Watershed G<br>Area - 4380 acres (6.84 sq. mi.) |          |               |              |        |               |      |        |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|----------|---------------|-------------------|-----------------------|----------------------------------------------------------------------|----------|---------------|--------------|--------|---------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                   | Jan.              | Feb. | Mar.                                      | Apr.     | May           | June              | July                  | Aug.                                                                 | Sept.    | Oct.          | Nov.         | Dec.   | Year          |      |        |      |
| 1957 P                                                                                                                                                                                                                                                                                                                                                                          |                   |      |                                           |          |               |                   | 0.02                  | 1/ 0.56                                                              | 4.30     | 8.15          | 4.58         | 0.84   | 18.45         |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                                                                               |                   |      |                                           |          |               |                   | 0                     | 0                                                                    | 0        | 1.64          | .70          | T      | 2.34          |      |        |      |
| 1958 P                                                                                                                                                                                                                                                                                                                                                                          | 1.94              | 3.29 | 1.37                                      | 3.12     | 2.04          | 2.12              | 1.10                  | 6.51                                                                 | 5.93     | 2.90          | 1.47         | 1.34   | 33.13         |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                                                                               | .06               | .65  | .02                                       | .02      | .43           | 0                 | 0                     | .55                                                                  | 1.29     | .22           | T            | T      | 3.24          |      |        |      |
| 1959 P                                                                                                                                                                                                                                                                                                                                                                          | .36               | 3.40 | 1.04                                      | 3.93     | 3.77          | 8.00              | 3.95                  | 3.22                                                                 | 2.08     | 6.73          | 1.97         | 3.79   | 42.24         |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                                                                               | T                 | .42  | .02                                       | .51      | .14           | 2.24              | .05                   | 0                                                                    | 0        | 1.63          | .53          | .83    | 6.37          |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                         |                   |      |                                           |          |               |                   |                       | Riesel (Waco), Texas Watershed G                                     |          |               |              |        |               |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                            | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |          |               |                   |                       |                                                                      |          |               |              |        |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      | 1 hour                                    |          | 2 hours       |                   | 6 hours               |                                                                      | 12 hours |               | 1 day        |        | 2 days        |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                 | Date              | Rate | Date                                      | Vol.     | Date          | Vol.              | Date                  | Vol.                                                                 | Date     | Vol.          | Date         | Vol.   | Date          | Vol. | Date   | Vol. |
| 1957 <sup>2/</sup>                                                                                                                                                                                                                                                                                                                                                              |                   |      |                                           |          |               |                   |                       |                                                                      |          |               |              |        |               |      |        |      |
| 1958                                                                                                                                                                                                                                                                                                                                                                            | 9-19              | 0.16 | 9-19                                      | 0.15     | 9-19          | 0.30              | 9-19                  | 0.71                                                                 | 9-19     | 1.00          | 9-19         | 1.08   | 9-19          | 1.09 | 9-19   | 1.28 |
| 1959                                                                                                                                                                                                                                                                                                                                                                            | 6-23              | .38  | 6-23                                      | .37      | 6-23          | .70               | 6-23                  | 1.39                                                                 | 6-23     | 1.59          | 6-23         | 1.63   | 6-23          | 1.91 | 6-23   | 1.94 |
| Notes: Quality of records: monthly P and Q, good; Annual Max. discharges and volumes, good. Watershed conditions: 1957-1959 land use essentially same as for 1939 with minor increase of conservation work, mainly terracing.* 1/ Station reestablished July 1, 1957. 2/ Peak rates and maximum volumes occurred at all stations prior to date of reestablishment of Station G. |                   |      |                                           |          |               |                   |                       |                                                                      |          |               |              |        |               |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                          |                   |      |                                           |          |               |                   |                       | Riesel (Waco), Texas Watershed G                                     |          |               |              |        |               |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                           |                   |      |                                           | Rainfall |               |                   |                       |                                                                      |          | Runoff        |              |        |               |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                            | Rainfall (inches) |      | Runoff (inches)                           |          | Date and time | Intensity (in/hr) |                       | Acc. (inches)                                                        |          | Date and time | Rate (in/hr) |        | Acc. (inches) |      |        |      |
| Event of February 14, 1959                                                                                                                                                                                                                                                                                                                                                      |                   |      |                                           |          |               |                   |                       |                                                                      |          |               |              |        |               |      |        |      |
| 1-14, 17-59                                                                                                                                                                                                                                                                                                                                                                     | 0                 |      | T                                         |          | 2-14-59       | Raingage          |                       | 65A                                                                  |          | 2-14-59       |              |        |               |      |        |      |
| 1-30                                                                                                                                                                                                                                                                                                                                                                            | .28               |      | T                                         |          | 2:00a         |                   | 0                     |                                                                      | 0        | 3:14a         |              | 0.0003 |               |      | C      |      |
| 1-31                                                                                                                                                                                                                                                                                                                                                                            | 0                 |      | T                                         |          | :03           |                   | 1.80                  |                                                                      | .09      | :25           |              | .0009  |               |      | .0001  |      |
| 2-1                                                                                                                                                                                                                                                                                                                                                                             | .45               |      | T                                         |          | :11           |                   | .30                   |                                                                      | .13      | :36           |              | .0029  |               |      | .0004  |      |
| 2-2                                                                                                                                                                                                                                                                                                                                                                             | .42               |      |                                           | .0028    | :45           |                   | .02                   |                                                                      | .15      | 4:00          |              | .0075  |               |      | .0023  |      |
| 2-3, 7                                                                                                                                                                                                                                                                                                                                                                          | 0                 |      |                                           | .0019    | :56           |                   | 1.03                  |                                                                      | .34      | :23           |              | .0166  |               |      | .0068  |      |
| 2-8                                                                                                                                                                                                                                                                                                                                                                             | .03               |      | T                                         |          | 3:03          |                   | 1.38                  |                                                                      | .50      | 5:00          |              | .0268  |               |      | .0207  |      |
| 2-9, 10                                                                                                                                                                                                                                                                                                                                                                         | 0                 |      |                                           | .0002    | :06           |                   | 2.20                  |                                                                      | .61      | :36           |              | .0340  |               |      | .0389  |      |
| 2-11                                                                                                                                                                                                                                                                                                                                                                            | .11               |      | T                                         |          | :10           |                   | 1.50                  |                                                                      | .71      | 6:06          |              | .0401  |               |      | .0574  |      |
| 2-12                                                                                                                                                                                                                                                                                                                                                                            | .22               |      |                                           | .0001    | :14           |                   | 1.65                  |                                                                      | .82      | :56           |              | .0455  |               |      | .0933  |      |
| 2-13                                                                                                                                                                                                                                                                                                                                                                            | .10               |      |                                           | .0003    | :21           |                   | .86                   |                                                                      | .92      | 7:54          |              | .0487  |               |      | .1389  |      |
| 2-14 <sup>1/</sup>                                                                                                                                                                                                                                                                                                                                                              | .02               |      |                                           | .0002    | :37           |                   | .34                   |                                                                      | 1.01     | 8:44          |              | .0480  |               |      | .1797  |      |
| Watershed Conditions: 55% of area bedded or plowed, no crop; 10% fall seeded oats and oats-clover; 2% native grass meadow, winter grasses included; 11% dormant annual and perennial forbs and grasses; 19% pasture, all classes, generally dormant, but some winter annuals; 3% farmsteads and gravel and paved roads.                                                         |                   |      |                                           |          |               |                   |                       |                                                                      |          |               |              |        |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | 4:00          |                   | .13                   |                                                                      | 1.06     | 9:59          |              | .0419  |               |      | .2364  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | :19           |                   | .19                   |                                                                      | 1.12     | 10:36         |              | .0374  |               |      | .2608  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | :38           |                   | .25                   |                                                                      | 1.20     | 11:33         |              | .0299  |               |      | .2928  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | :53           |                   | .28                   |                                                                      | 1.27     | :55           |              | .0279  |               |      | .3033  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | 5:05          |                   | .25                   |                                                                      | 1.32     | 12:35p        |              | .0225  |               |      | .3201  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | :15           |                   | .30                   |                                                                      | 1.37     | :53           |              | .0206  |               |      | .3265  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | 6:30          |                   | .16                   |                                                                      | 1.39     | 1:42          |              | .0152  |               |      | .3411  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 5                     |                                                                      | 1.30     | 3:40          |              | .0070  |               |      | .3612  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 14                    |                                                                      | 1.34     | 5:26          |              | .0045  |               |      | .3712  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 20                    |                                                                      | 1.30     | 8:42          |              | .0026  |               |      | .3827  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 26-A                  |                                                                      | 1.35     | 12:00m        |              | .0016  |               |      | .3894  |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 30-A                  |                                                                      | 1.31     |               |              |        |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 48-A                  |                                                                      | 1.19     |               |              |        |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 56-A                  |                                                                      | 1.34     |               |              |        |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 70                    |                                                                      | 1.42     |               |              |        |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 84-A                  |                                                                      | 1.37     |               |              |        |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Raingage      |                   | 89                    |                                                                      | 1.46     |               |              |        |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          | Weighted      |                   | Average <sup>2/</sup> |                                                                      | 1.33     |               |              |        |               |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 4416.48. 1/ Prior to event beginning 2:00a. 2/ Thiessen method. * See page 42.4-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, SWC, June 1957 (reprinted 1961).                                                                                                         |                   |      |                                           |          |               |                   |                       |                                                                      |          |               |              |        |               |      |        |      |

Cooperative Research Project of USDA and Texas Agricultural Experiment Station

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                 |               |                       |               | Riesel (Waco), Texas Watershed G |              |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-----------------------|---------------|----------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                 | Rainfall      |                       |               | Runoff                           |              |               |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                    | Rate (in/hr) | Acc. (inches) |
| Event of June 23-24, 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |               |                       |               |                                  |              |               |
| 5-23-59                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.29              | 0.0432          | 6-23-59       | Raingage              | 65A           | 6-23-59                          |              |               |
| 5-24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .04               | .0104           | 8:49p         | 0                     | 0             | 8:56p                            | 0.0001       |               |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .16               | .0105           | :52           | 5.00                  | .25           | 10:02                            | .0010        | T             |
| 5-26, 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0                 | .0058           | :57           | 2.88                  | .49           | :08                              | .0040        | .0003         |
| 6-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .22               | 0               | :00           | 2.60                  | .62           | :14                              | .0090        | .0009         |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .02               | 0               | :03           | 2.40                  | .74           | :18                              | .0143        | .0017         |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.29              | .0935           | :08           | 3.00                  | .99           | :30                              | .0317        | .0060         |
| 6-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .80               | .1895           | :12           | 1.80                  | 1.11          | :36                              | .0571        | .0104         |
| 6-6, 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   | .0259           | :48           | 0                     | 1.11          | :42                              | .0881        | .0176         |
| 6-12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .22               | 0               | :52           | 1.80                  | 1.23          | :48                              | .104         | .0281         |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .86               | 0               | :55           | 2.60                  | 1.36          | :54                              | .176         | .0430         |
| 6-21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .64               | 0               | :58           | 4.80                  | 1.60          | 11:00                            | .229         | .0634         |
| 6-23 1/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .08               | T               | 10:01         | 5.00                  | 1.85          | :06                              | .274         | .0885         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :06           | 3.96                  | 2.18          | :12                              | .321         | .1183         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :09           | 2.80                  | 2.32          | :18                              | .362         | .1505         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :11           | 1.80                  | 2.44          | :29                              | .384         | .2218         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :20           | .77                   | 2.53          | :31                              | .384         | .2347         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :25           | .96                   | 2.61          | :34                              | .384         | .2539         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :30           | 1.32                  | 2.72          | :45                              | .379         | .3239         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :41           | .49                   | 2.81          | 12:00m                           | .372         | .4174         |
| Watershed Conditions: 19% of area in corn, grain in dough stage; 16% cotton, beginning to bloom; 8% grain sorghum, grain in dough stage; 2% broadcast grain sorghum, grain in dough stage; 7% oats and oats-clover, oats harvested, stubble being grazed; 4% sweet clover, seed mature; 10% sudan, seed mature, being grazed; 10% idle crop land, annual and perennial forbs and grasses; 2% native grass ready w. good growth, ready to cut for hay; 10% pasture, all classes; 3% farmsteads and gravel and paved roads. |                   |                 |               |                       |               |                                  |              |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :45           | 1.50                  | 2.91          | 6-24-59                          |              |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | 11:02         | .40                   | 2.94          | 12:15a                           | .356         | .5084         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | 12:00m        | .07                   | 3.01          | :42                              | .326         | .6622         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 5                     | 2.64          | 1:06                             | .297         | .7872         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 14                    | 2.41          | :42                              | .253         | .9523         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 20                    | 2.75          | 2:04                             | .223         | 1.0396        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 26A                   | 2.99          | :27                              | .14          | 1.1195        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 30A                   | 3.23          | 3:02                             | .152         | 1.2198        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 48A                   | 3.17          | :54                              | .108         | 1.3311        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 5A                    | 3.52          | 5:15                             | .0662        | 1.4458        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 70                    | 2.73          | 5:19                             | .0451        | 1.5048        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 84A                   | 2.69          | 7:27                             | .0279        | 1.5454        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 89                    | 2.62          | 9:05                             | .0147        | 1.5799        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Weighted      | Average <sup>2/</sup> | 2.92          | 10:12                            | .0084        | 1.5925        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 12:36p                           | .0046        | 1.6070        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 3:08                             | .0027        | 1.6160        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 6:46                             | .0013        | 1.6227        |
| Event of November 4, 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |               |                       |               |                                  |              |               |
| 10-4-59                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.06              | 1.4172          | 11-4-59       | Raingage              | 65A           | 11-4-59                          |              |               |
| 10-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .01               | .0649           | 12:09a        | 0                     | 0             | 12:40a                           | 0.0008       |               |
| 10-6, 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0                 | .0054           | :12           | .80                   | .04           | 1:00                             | .0021        | .0004         |
| 10-13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.50              | .0694           | :15           | 1.20                  | .10           | :31                              | .0051        | .0023         |
| 10-14, 26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0                 | .0763           | :18           | .60                   | .13           | :56                              | .0087        | .0052         |
| 10-29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | .34               | T               | :21           | 2.20                  | .24           | 2:18                             | .0147        | .0093         |
| 10-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | .24               | .0001           | :25           | .75                   | .29           | :54                              | .0369        | .0238         |
| 10-31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | .10               | .0004           | 1:29          | .90                   | .38           | 3:18                             | .0612        | .0435         |
| 11-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .02               | .0003           | :33           | 1.35                  | .47           | :58                              | .0743        | .0904         |
| 11-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0                 | .0002           | :44           | .05                   | .48           | 4:12                             | .0725        | .1075         |
| 11-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .73               | .0005           | :55           | .22                   | .52           | :56                              | .0643        | .1509         |
| 11-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .01               | .0005           | 2:01          | .60                   | .58           | 5:24                             | .0598        | .1861         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :06           | .24                   | .60           | 6:08                             | .0555        | .2284         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :13           | .60                   | .67           | 7:16                             | .0483        | .2875         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :25           | .10                   | .69           | 8:25                             | .0396        | .3381         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :28           | 1.60                  | .77           | 9:06                             | .0356        | .3638         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :33           | 1.08                  | .86           | :46                              | .0310        | .3859         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :41           | .30                   | .90           | 10:22                            | .0281        | .4036         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | 3:13          | .04                   | .92           | 11:14                            | .0227        | .4256         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :25           | .20                   | .96           | 11:58                            | .0186        | .4406         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | :47           | .03                   | .97           | 1:01p                            | .0139        | .4582         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 5                     | .79           |                                  |              |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 14                    | .79           |                                  |              |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Raingage      | 20                    | .86           |                                  |              |               |
| Notes: To convert runoff in in/hr to cfs, multiply by 4416.46. 1/ Prior to event beginning 8:49p. 2/ Thiessen method. 3/ Prior to event beginning 12:09a.                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |               |                       |               |                                  |              |               |

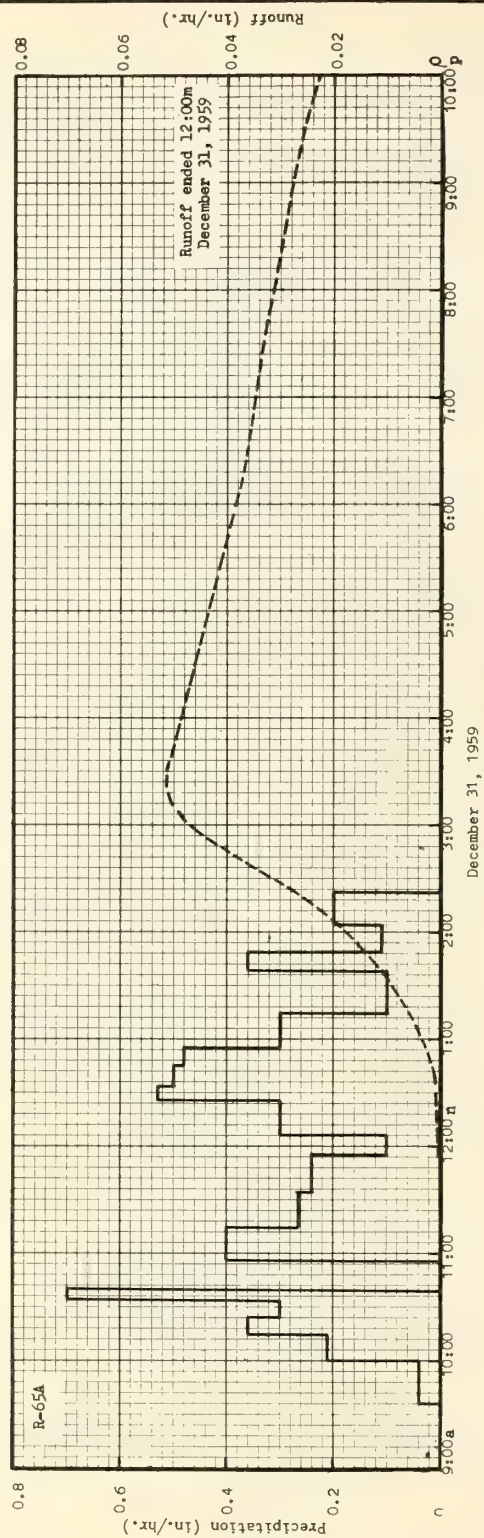
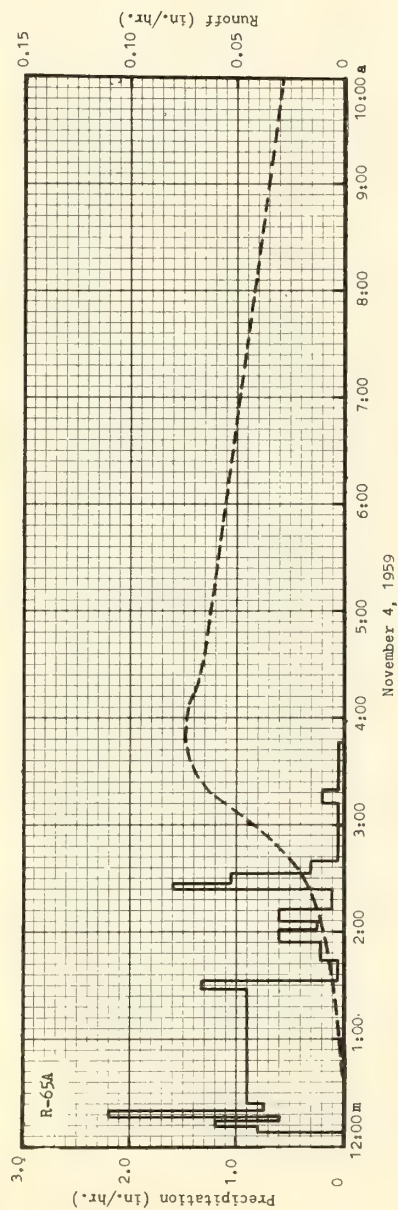
(Continued - next page)

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                              |                      |                    |                  |                       |                  | Riesel (Waco), Texas Watershed G |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|-----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                               |                      |                    | Rainfall         |                       |                  | Runoff                           |                 |                  |
| Date                                                                                                                                                                                                                                                                                                | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr)  | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of November 4, 1959 - Continued                                                                                                                                                                                                                                                               |                      |                    |                  |                       |                  |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | 11-4-59          |                       |                  | 11-4-59                          |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 26A                   | 0.86             | 2:21                             | .0087           | .4729            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 30A                   | .93              | 5:54                             | .0034           | .4919            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 56A                   | 1.04             | 11:02                            | .0016           | .5042            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 65A                   | .97              | 12:00m                           | .0014           | .5057            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 70                    | 1.03             | 11-5-59                          |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 84A                   | .98              | 9:18a                            | .0005           | .5138            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 89                    | .94              | 12:00m                           | .0002           | .5185            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Weighted         | Average <sup>1/</sup> | .92              |                                  |                 |                  |
| Event of December 31, 1959                                                                                                                                                                                                                                                                          |                      |                    |                  |                       |                  |                                  |                 |                  |
| 11-30,                                                                                                                                                                                                                                                                                              |                      |                    | 12-31-59         | Raingage              | 65A              | 12-31-59                         |                 |                  |
| 12-9-59                                                                                                                                                                                                                                                                                             | 0                    | 0.0002             | 9:37a            | 0                     | 0                | 11:54a                           | 0.0003          | 0                |
| 12-10                                                                                                                                                                                                                                                                                               | .09                  | T                  | 10:01            | .04                   | .02              | 12:40p                           | .0011           | .0005            |
| 12-11                                                                                                                                                                                                                                                                                               | .77                  | T                  | :15              | .21                   | .07              | :56                              | .0028           | .0009            |
| 12-12, 14                                                                                                                                                                                                                                                                                           | 0                    | .0066              | :25              | .36                   | .13              | 1:06                             | .0043           | .0015            |
| 12-15                                                                                                                                                                                                                                                                                               | 1.29                 | .2848              | :35              | .30                   | .18              | :24                              | .0080           | .0034            |
| 12-16                                                                                                                                                                                                                                                                                               | .09                  | .0880              | :41              | .70                   | .25              | :42                              | .0123           | .0064            |
| 12-17                                                                                                                                                                                                                                                                                               | .20                  | .0390              | :57              | 0                     | .25              | :56                              | .0165           | .0098            |
| 12-18, 22                                                                                                                                                                                                                                                                                           | 0                    | .0389              | 11:15            | .40                   | .37              | 2:24                             | .0279           | .0199            |
| 12-23                                                                                                                                                                                                                                                                                               | .01                  | .0021              | :35              | .27                   | .46              | :50                              | .0430           | .0356            |
| 12-24, 26                                                                                                                                                                                                                                                                                           | 0                    | .0058              | :55              | .24                   | .54              | 3:14                             | .0507           | .0545            |
| 12-27                                                                                                                                                                                                                                                                                               | .16                  | .0034              | 12:07p           | .10                   | .56              | :28                              | .0517           | .0664            |
| 12-28, 30                                                                                                                                                                                                                                                                                           | 0                    | .0037              | :25              | .30                   | .65              | :38                              | .0503           | .0749            |
| 12-31. 2/                                                                                                                                                                                                                                                                                           | .03                  | .0005              | :33              | .53                   | .72              | 4:28                             | .0462           | .1150            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | :45              | .50                   | .82              | :58                              | .0439           | .1376            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | :55              | .48                   | .90              | 5:36                             | .0406           | .1644            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | 1:15             | .30                   | 1.00             | 6:20                             | .0372           | .1929            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | :39              | .10                   | 1.04             | 7:46                             | .0326           | .2426            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | :49              | .36                   | 1.10             | 8:24                             | .0308           | .2627            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | 2:05             | .11                   | 1.13             | 9:18                             | .0272           | .2889            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | :23              | .20                   | 1.19             | 10:12                            | .0215           | .3112            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 5                     | 1.07             | 11:08                            | .0165           | .3288            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 14                    | 1.01             | 12:00m                           | .0130           | .3416            |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 20                    | 1.13             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 26A                   | 1.11             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 30A                   | 1.15             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 48A                   | 1.23             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 56A                   | 1.15             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 70                    | 1.12             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 84A                   | 1.16             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Raingage         | 89                    | 1.21             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                     |                      |                    | Weighted         | Average <sup>1/</sup> | 1.14             |                                  |                 |                  |
| Watershed Conditions: 4% of area in fall seeded oats, poor growth; 19% pasture, all classes, dormant except some winter annuals; 2% native grass meadow, dormant; 47% cropland tilled, no crop growing; 25% idle crop land, untilled, dormant vegetation; 3% farmsteads and gravel and paved roads. |                      |                    |                  |                       |                  |                                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 4416.48. <sup>1/</sup> Thiessen method. <sup>2/</sup> Prior to event beginning 9:37a.                                                                                                                                                         |                      |                    |                  |                       |                  |                                  |                 |                  |

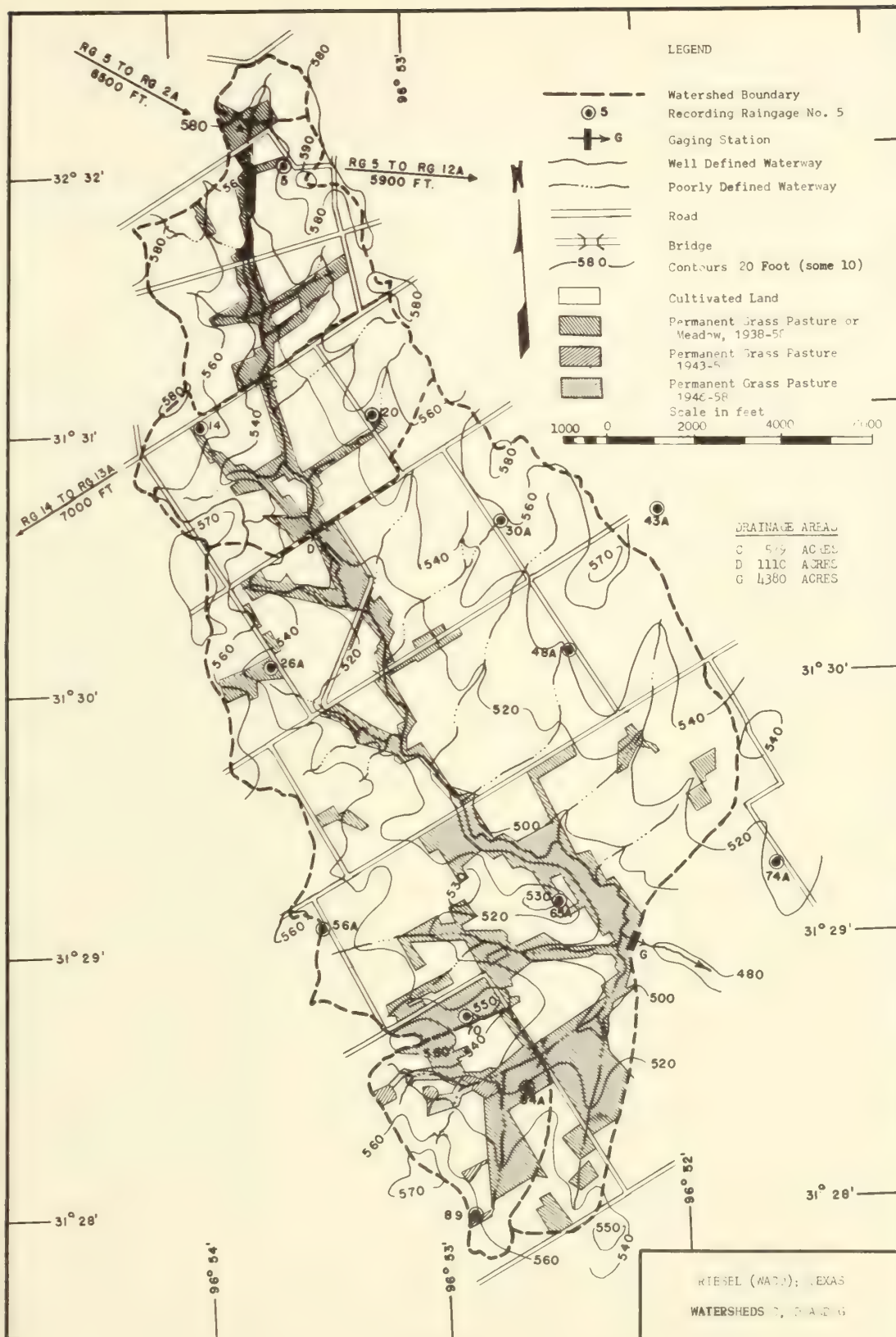


RIESEL (WACO), TEXAS Watershed G





RIESEL (WACO), TEXAS Watershed G



| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                 |                   |      |                                           |          |               |                       |               | Riesel (Waco), Texas Watershed W-1<br>(Area - 176 acres) |              |       |               |      |        |       |        |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|----------|---------------|-----------------------|---------------|----------------------------------------------------------|--------------|-------|---------------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                             |                   | Jan. | Feb.                                      | Mar.     | Apr.          | May                   | June          | July                                                     | Aug.         | Sept. | Oct.          | Nov. | Dec.   | Year  |        |      |
| 1956                                                                                                                                                                                                                                                                                                                      | P                 | 2.17 | 2.52                                      | 0.42     | 0.75          | 4.33                  | 1.53          | 1.72                                                     | 2.62         | 0     | 0.26          | 4.44 | 2.06   | 22.82 |        |      |
|                                                                                                                                                                                                                                                                                                                           | Q                 | 0    | 0                                         | 0        | 0             | .03                   | 0             | 0                                                        | 0            | 0     | 0             | .38  | T      | .41   |        |      |
| 1957                                                                                                                                                                                                                                                                                                                      | P                 | 1.46 | 3.05                                      | 5.58     | 14.67         | 8.13                  | 4.21          | .10                                                      | 1.00         | 4.09  | 8.41          | 4.75 | .88    | 56.33 |        |      |
|                                                                                                                                                                                                                                                                                                                           | Q                 | 0    | .02                                       | .70      | 9.96          | 5.57                  | .80           | T                                                        | 0            | 0     | 1.83          | .81  | .04    | 19.73 |        |      |
| 1958                                                                                                                                                                                                                                                                                                                      | P                 | 1.73 | 3.51                                      | 1.33     | 3.25          | 1.98                  | 2.34          | 1.16                                                     | 6.30         | 5.27  | 2.66          | 1.36 | 1.48   | 32.37 |        |      |
|                                                                                                                                                                                                                                                                                                                           | Q                 | .10  | 1.08                                      | .08      | .08           | .63                   | .01           | T                                                        | .36          | .57   | .26           | .02  | .02    | 3.21  |        |      |
| 1959                                                                                                                                                                                                                                                                                                                      | P                 | .41  | 3.42                                      | 1.09     | 4.14          | 3.96                  | 7.01          | 4.56                                                     | 3.22         | 1.93  | 7.22          | 1.92 | 3.64   | 42.52 |        |      |
|                                                                                                                                                                                                                                                                                                                           | Q                 | .02  | .67                                       | .06      | .73           | .41                   | 2.10          | .23                                                      | .03          | .01   | 1.94          | .66  | .95    | 7.81  |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                   |                   |      |                                           |          |               |                       |               | Riesel (Waco), Texas Watershed W-1                       |              |       |               |      |        |       |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                      | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |          |               |                       |               |                                                          |              |       |               |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                           |                   |      | 1 hour                                    |          | 2 hours       |                       | 6 hours       |                                                          | 12 hours     |       | 1 day         |      | 2 days |       | 8 days |      |
|                                                                                                                                                                                                                                                                                                                           | Date              | Rate | Date                                      | Vol.     | Date          | Vol.                  | Date          | Vol.                                                     | Date         | Vol.  | Date          | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                                                                                                                                                                                      | 4-19              | 2.87 | 4-19                                      | 2.22     | 4-19          | 2.68                  | 4-23          | 3.43                                                     | 4-23         | 3.50  | 4-23          | 3.51 | 4-23   | 5.15  | 4-19   | 5.36 |
| 1958                                                                                                                                                                                                                                                                                                                      | 8-24              | .31  | 8-24                                      | .19      | 8-24          | .26                   | 5-3           | .39                                                      | 2-22         | .57   | 2-22          | .91  | 2-22   | 1.00  | 2-21   | 1.05 |
| 1959                                                                                                                                                                                                                                                                                                                      | 6-23              | 1.89 | 6-23                                      | 1.24     | 6-23          | 1.51                  | 6-23          | 1.63                                                     | 6-23         | 1.66  | 6-23          | 1.66 | 6-23   | 1.76  | 6-22   | 1.77 |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volumes, excellent. Watershed conditions: No appreciable change in land use since 1955. See page 42.6-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, SMC, June 1957 (reprinted 1961). |                   |      |                                           |          |               |                       |               |                                                          |              |       |               |      |        |       |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                    |                   |      |                                           |          |               |                       |               | Riesel (Waco), Texas Watershed W-1                       |              |       |               |      |        |       |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                     |                   |      |                                           | Rainfall |               |                       |               | Runoff                                                   |              |       |               |      |        |       |        |      |
| Date                                                                                                                                                                                                                                                                                                                      | Rainfall (inches) |      | Runoff (inches)                           |          | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                                            | Rate (in/hr) |       | Acc. (inches) |      |        |       |        |      |
| Event of May 13, 1957                                                                                                                                                                                                                                                                                                     |                   |      |                                           |          |               |                       |               |                                                          |              |       |               |      |        |       |        |      |
| 4-13-57                                                                                                                                                                                                                                                                                                                   | 0.04              |      | 0                                         |          | 5-13-57       | Raingage              | W-2A          | 5-13-57                                                  |              |       |               |      |        |       |        |      |
| 4-15                                                                                                                                                                                                                                                                                                                      | .02               |      | 0                                         |          | 8:22a         | 0                     | 0             | 8:00a                                                    | 0.0001       |       | 0             |      |        |       |        |      |
| 4-19                                                                                                                                                                                                                                                                                                                      | 4.82              |      | 2.7346                                    |          | :25           | 2.00                  | .10           | :27                                                      | .0007        |       | .0001         |      |        |       |        |      |
| 4-20                                                                                                                                                                                                                                                                                                                      | .23               |      | .2107                                     |          | :29           | 1.95                  | .23           | :31                                                      | .0022        |       | .0002         |      |        |       |        |      |
| 4-21                                                                                                                                                                                                                                                                                                                      | .21               |      | .0086                                     |          | :33           | 2.25                  | .38           | :33                                                      | .0070        |       | .0003         |      |        |       |        |      |
| 4-22                                                                                                                                                                                                                                                                                                                      | .30               |      | .0588                                     |          | :36           | 4.60                  | .61           | :35                                                      | .0360        |       | .0010         |      |        |       |        |      |
| 4-23                                                                                                                                                                                                                                                                                                                      | 3.99              |      | 3.5059                                    |          | :41           | 1.92                  | .77           | :38                                                      | .0598        |       | .0034         |      |        |       |        |      |
| 4-24                                                                                                                                                                                                                                                                                                                      | 1.85              |      | 1.5413                                    |          | :45           | 1.50                  | .87           | :40                                                      | .171         |       | .0069         |      |        |       |        |      |
| 4-25                                                                                                                                                                                                                                                                                                                      | 0                 |      | .0122                                     |          | :51           | 2.40                  | 1.11          | :42                                                      | .470         |       | .0186         |      |        |       |        |      |
| 4-26                                                                                                                                                                                                                                                                                                                      | 1.43              |      | .7975                                     |          | :56           | .96                   | 1.19          | :44                                                      | .762         |       | .0386         |      |        |       |        |      |
| 4-27                                                                                                                                                                                                                                                                                                                      | .27               |      | .3343                                     |          | :59           | 1.80                  | 1.28          | :48                                                      | 1.26         |       | .1061         |      |        |       |        |      |
| 4-28                                                                                                                                                                                                                                                                                                                      | 1.12              |      | .5871                                     |          | 9:14          | .24                   | 1.34          | :52                                                      | 1.52         |       | .1993         |      |        |       |        |      |
| 4-29                                                                                                                                                                                                                                                                                                                      | .06               |      | .0532                                     |          | :38           | .20                   | 1.42          | :55                                                      | 1.62         |       | .2776         |      |        |       |        |      |
| 4-30                                                                                                                                                                                                                                                                                                                      | .01               |      | .0025                                     |          | :52           | .26                   | 1.48          | :57                                                      | 1.64         |       | .3317         |      |        |       |        |      |
| 5-1                                                                                                                                                                                                                                                                                                                       | .35               |      | .0737                                     |          | 10:10         | .20                   | 1.54          | :59                                                      | 1.63         |       | .3861         |      |        |       |        |      |
| 5-2                                                                                                                                                                                                                                                                                                                       | 0                 |      | .0043                                     |          | :20           | .24                   | 1.58          | 9:04                                                     | 1.51         |       | .5175         |      |        |       |        |      |
| 5-3                                                                                                                                                                                                                                                                                                                       | .93               |      | .5798                                     |          | :37           | .14                   | 1.62          | :12                                                      | 1.19         |       | .6977         |      |        |       |        |      |
| 5-4, 7                                                                                                                                                                                                                                                                                                                    | 0                 |      | .0076                                     |          | Raingage      | 75A                   | 1.60          | :16                                                      | 1.04         |       | .7718         |      |        |       |        |      |
| 5-8                                                                                                                                                                                                                                                                                                                       | .02               |      | .0001                                     |          | Raingage      | 89                    | 1.62          | :20                                                      | .858         |       | .8354         |      |        |       |        |      |
| 5-9                                                                                                                                                                                                                                                                                                                       | .91               |      | .2095                                     |          | Raingage      | W-4                   | 1.61          | :24                                                      | .694         |       | .8871         |      |        |       |        |      |
| 5-10                                                                                                                                                                                                                                                                                                                      | 0                 |      | .0031                                     |          | Weighted      | Average <sup>2/</sup> | 1.62          | :28                                                      | .489         |       | .9261         |      |        |       |        |      |
| 5-11                                                                                                                                                                                                                                                                                                                      | 3.89              |      | 3.2110                                    |          |               |                       |               | :38                                                      | .353         |       | 1.44          |      |        |       |        |      |
| 5-12                                                                                                                                                                                                                                                                                                                      | 0                 |      | .0836                                     |          |               |                       |               | 10:00                                                    | .224         |       | 1.0941        |      |        |       |        |      |
| 5-13 <sup>1/</sup>                                                                                                                                                                                                                                                                                                        | 0                 |      | .11                                       |          |               |                       |               | :13                                                      | .202         |       | 1.1402        |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                           |                   |      |                                           |          |               |                       |               | :32                                                      | .184         |       | 1.2010        |      |        |       |        |      |
| Watershed Conditions: 20% of area in corn cultivated mid-April; 28% bedded for cotton, no crop; 9% row grain sorghum planted second week of April; 2% sorghum hay broadcast second week of April; 19% oats in bloom stage; 3% native grass (Continued)                                                                    |                   |      |                                           |          |               |                       |               |                                                          |              |       |               |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                           |                   |      |                                           |          |               |                       |               | 11:13                                                    | .0915        |       | 1.2990        |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                           |                   |      |                                           |          |               |                       |               | :35                                                      | .0525        |       | 1.3253        |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                           |                   |      |                                           |          |               |                       |               | 12:20p                                                   | .0238        |       | 1.3519        |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                           |                   |      |                                           |          |               |                       |               | 1:00                                                     | .0138        |       | 1.3641        |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                           |                   |      |                                           |          |               |                       |               | 2:05                                                     | .0068        |       | 1.3747        |      |        |       |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 177.41. 1/ Runoff prior to 8:00a. 2/ Thiessen method. For map of watershed, see page 42.6-6, Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS, SMC, January 1960.                                                                 |                   |      |                                           |          |               |                       |               |                                                          |              |       |               |      |        |       |        |      |

Cooperative research project of USDA and Texas Agricultural Experiment Station



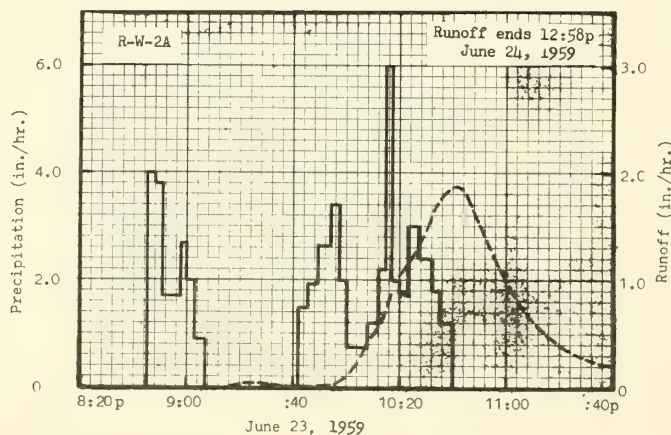
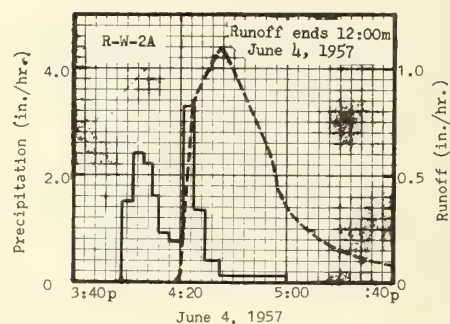
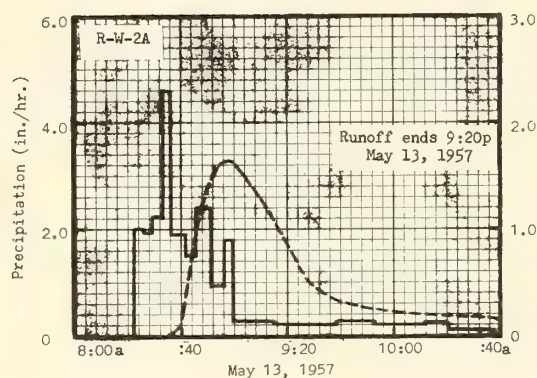
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                 |                   |                 | Riesel (Waco), Texas |                   |               | Watershed W-1 |              |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|----------------------|-------------------|---------------|---------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                  |                   |                 | Rainfall             |                   |               | Runoff        |              |               |
| Date                                                                                                                                                                                                                                                                                                   | Rainfall (inches) | Runoff (inches) | Date and time        | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches) |
| Event of May 13, 1957 - Continued                                                                                                                                                                                                                                                                      |                   |                 |                      |                   |               |               |              |               |
| meadow, dense growth; 14% Bermuda grass and weeds 4" high, fair cover; 5% bermudagrass and gravel roads. Straight row cultivation.                                                                                                                                                                     |                   |                 |                      |                   |               | 5:14:57       |              |               |
|                                                                                                                                                                                                                                                                                                        |                   |                 |                      |                   |               | 3:30p         | 0.0035       | 1.3418        |
|                                                                                                                                                                                                                                                                                                        |                   |                 |                      |                   |               | 4:50          | .0020        | 1.3854        |
|                                                                                                                                                                                                                                                                                                        |                   |                 |                      |                   |               | 7:00          | .0011        | 1.3886        |
|                                                                                                                                                                                                                                                                                                        |                   |                 |                      |                   |               | 9:20          | .0006        | 1.3906        |
| Event of June 4, 1957                                                                                                                                                                                                                                                                                  |                   |                 |                      |                   |               |               |              |               |
| 5-14, 15                                                                                                                                                                                                                                                                                               | .0                | 0.0076          | 6-4-57               | Raingage          | W-2A          | 6-4-57        |              |               |
| 5-15                                                                                                                                                                                                                                                                                                   | .0                | .0001           | 3:58p                | 0                 | 0             | 4:06p         | 0.0009       | 0             |
| 5-16                                                                                                                                                                                                                                                                                                   | .91               | .2095           | 4:02                 | 1.50              | .10           | :10           | .0022        | .0001         |
| 5-10                                                                                                                                                                                                                                                                                                   | 0                 | .0031           | :06                  | 2.40              | .26           | :17           | .0045        | .0005         |
| 5-11                                                                                                                                                                                                                                                                                                   | 3.89              | 3.2110          | :09                  | 2.22              | .37           | :18           | .0062        | .0006         |
| 5-12                                                                                                                                                                                                                                                                                                   | 0                 | .0836           | :12                  | 1.60              | .45           | :20           | .0238        | .11           |
| 5-13                                                                                                                                                                                                                                                                                                   | 1.66              | 1.3933          | :16                  | .90               | .51           | :22           | .428         | .0054         |
| 5-14, 15                                                                                                                                                                                                                                                                                               | 0                 | .0055           | :21                  | 2.76              | .74           | :24           | .847         | .0287         |
| 5-16                                                                                                                                                                                                                                                                                                   | .05               | .0003           | :25                  | 3.30              | .96           | :31           | 1.00         | .1371         |
| 5-17                                                                                                                                                                                                                                                                                                   |                   | .0002           | :29                  | 1.35              | 1.05          | :33           | 1.06         | .1714         |
| 5-18                                                                                                                                                                                                                                                                                                   | .04               | .0003           | :35                  | .40               | 1.09          | :35           | 1.09         | .2071         |
| 5-19, 22                                                                                                                                                                                                                                                                                               |                   |                 | 5:00                 | .10               | 1.13          | :41           | 1.13         | .2428         |
| 5-23                                                                                                                                                                                                                                                                                                   | .14               | .0003           | Raingage             | 75A               | 1.73          | :41           | .948         | .3099         |
| 5-24                                                                                                                                                                                                                                                                                                   | 0                 | .0001           | Raingage             | 89                | 1.39          | :46           | .824         | .3827         |
| 5-25                                                                                                                                                                                                                                                                                                   | .02               | .0001           | Raingage             | W-4               | .84           | :51           | .666         | .4452         |
| 5-26                                                                                                                                                                                                                                                                                                   | .08               | .0002           | Weighted             | 2/                | 1.20          | :56           | .476         | .4930         |
| 6-1                                                                                                                                                                                                                                                                                                    | 1.15              | .0132           |                      |                   |               | 5:00          | .347         | .5197         |
| 6-2                                                                                                                                                                                                                                                                                                    | 0                 | .0028           |                      |                   |               | :08           | .239         | .5581         |
| 6-3                                                                                                                                                                                                                                                                                                    | .44               | .0192           |                      |                   |               | :20           | .14          | .5955         |
|                                                                                                                                                                                                                                                                                                        |                   |                 |                      |                   |               | :35           | .0875        | .6241         |
| 6-4                                                                                                                                                                                                                                                                                                    | .12               | .0009           |                      |                   |               | 6:05          | .0366        | .6531         |
| Watershed Conditions: 20% corn; 9% grain sorghum, cultivated mid-May; 28% cotton planted last of May; 2% sorghum (sprouted), good stand; 10% native grass; 2% native brush; 14% Bermuda grass pasture grazed in May; 5% farmstead and roads. Straight rows.                                            |                   |                 |                      |                   |               | :55           | .0164        | .6737         |
|                                                                                                                                                                                                                                                                                                        |                   |                 |                      |                   |               | 8:00          | .0096        | .6868         |
|                                                                                                                                                                                                                                                                                                        |                   |                 |                      |                   |               | :25           | .0096        | .6908         |
|                                                                                                                                                                                                                                                                                                        |                   |                 |                      |                   |               | :45           | .0044        | .6996         |
|                                                                                                                                                                                                                                                                                                        |                   |                 |                      |                   |               | 12:00 m       | .0025        | .7070         |
| Event of June 11, 1957                                                                                                                                                                                                                                                                                 |                   |                 |                      |                   |               |               |              |               |
| 5-23-59                                                                                                                                                                                                                                                                                                | .1                | 0.1156          | 6-23-59              | Raingage          | W-2A          | 6-23-59       |              |               |
| 5-24                                                                                                                                                                                                                                                                                                   | .03               | .0048           | :45p                 | 0                 | 0             | :13p          | 0.0019       | 0             |
| 5-25                                                                                                                                                                                                                                                                                                   | 1                 | .0019           | :48                  | 4.00              | .20           | :16           | .0072        | .0002         |
| 5-26, 31                                                                                                                                                                                                                                                                                               | 0                 | .0072           | :51                  | 3.80              | .39           | :19           | .0266        | .11           |
| 6-1                                                                                                                                                                                                                                                                                                    | 0                 | .0011           | :58                  | 1.71              | .59           | :25           | .0393        | .0045         |
| 6-2                                                                                                                                                                                                                                                                                                    | .20               | .0018           |                      | 2.70              | .68           | :44           | .0287        | .0096         |
| 6-3                                                                                                                                                                                                                                                                                                    | .02               | .0013           |                      | 2.00              | .78           | :40           | .0211        | .0121         |
| 6-4                                                                                                                                                                                                                                                                                                    | 1.40              | .2079           | :07                  | .90               | .84           | :48           | .0160        | .0151         |
| 6-5                                                                                                                                                                                                                                                                                                    | .54               | .0921           | :41                  | 0                 | .84           | :55           | .0194        | .0166         |
| 6-6, 11                                                                                                                                                                                                                                                                                                | 0                 | .0011           | :45                  | 1.50              | .94           | :56           | .0266        | .11           |
| 6-12                                                                                                                                                                                                                                                                                                   | .24               | .0017           | :49                  | 1.95              | 1.07          | :58           | .0576        | .0183         |
| 6-13, 19                                                                                                                                                                                                                                                                                               | 0                 | .0032           | :54                  | 2.64              | 1.29          | 10:00         | .112         | .0210         |
| 6-14                                                                                                                                                                                                                                                                                                   | .76               | .0031           | :57                  | 3.40              | 1.46          | :04           | .244         | .11           |
| 6-21                                                                                                                                                                                                                                                                                                   | 0                 | .0008           | 10:00                | 2.00              | 1.56          | :08           | .440         | .0543         |
| 6-22                                                                                                                                                                                                                                                                                                   | .32               | .0019           | :08                  | .75               | 1.66          | :12           | .553         | .0885         |
| 6-23                                                                                                                                                                                                                                                                                                   | 0                 | .0015           | :12                  | 1.20              | 1.74          | :16           | .824         | .134          |
|                                                                                                                                                                                                                                                                                                        |                   |                 | :15                  | 2.20              | 1.85          | :20           | 1.08         | .1981         |
|                                                                                                                                                                                                                                                                                                        |                   |                 | :17                  | 6.00              | 2.05          | :28           | 1.36         | .3600         |
|                                                                                                                                                                                                                                                                                                        |                   |                 | :20                  | 2.00              | 2.15          | :32           | 1.59         | .4581         |
|                                                                                                                                                                                                                                                                                                        |                   |                 | :23                  | 1.80              | 2.24          | :37           | 1.82         | .611          |
| Watershed Conditions: 47% of area in corn, beginning to grain, cultivated mid-June; 10% cotton in hard down stage; 12% native stubble, oats harvested; 3% native grass meadow, dense growth; 14% Bermuda grass and weed pasture, fair cover; 5% farmsteads and gravel roads. Straight row cultivation. |                   |                 |                      |                   |               | :44           | 1.89         | .6939         |
|                                                                                                                                                                                                                                                                                                        |                   |                 | :52                  | 3.00              | 2.44          | :45           | 1.81         | .8477         |
|                                                                                                                                                                                                                                                                                                        |                   |                 | :55                  | 1.80              | 2.73          | :50           | 1.49         | .9852         |
|                                                                                                                                                                                                                                                                                                        |                   |                 | :40                  | 1.20              | 2.83          | :58           | 1.06         | .11           |
|                                                                                                                                                                                                                                                                                                        |                   |                 | Raingage             | 75A               | 2.79          | 11:05         | .745         | 1.2575        |
|                                                                                                                                                                                                                                                                                                        |                   |                 | Raingage             | 89                | 2.82          | :15           | .476         | 1.3578        |
|                                                                                                                                                                                                                                                                                                        |                   |                 | Raingage             | W-4               | 2.95          | :27           | .294         | 1.4318        |
|                                                                                                                                                                                                                                                                                                        |                   |                 | Weighted             | Average           | 2.83          | :30           | .244         | 1.4318        |

Notes: To convert runoff in inches to ft, multiply by 177.41. 1/ Prior rainfall ended 10:50a. 2/ Thiessen method.  
 3/ Runoff prior to 5:13p.



| SELECTED RUNOFF EVENTS                 |                   |                 |               |                   |               | Riesel (Waco), Texas Watershed W-1 |              |               |
|----------------------------------------|-------------------|-----------------|---------------|-------------------|---------------|------------------------------------|--------------|---------------|
| Antecedent conditions                  |                   |                 | Rainfall      |                   |               | Runoff                             |              |               |
| Date                                   | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                      | Rate (in/hr) | Acc. (inches) |
| Event of June 23, 24, 1959 - Continued |                   |                 |               |                   |               | 6-23-59                            |              |               |
|                                        |                   |                 |               |                   |               | 12:00m                             | 0.114        | 1.5319        |
|                                        |                   |                 |               |                   |               | 6-24-59                            |              |               |
|                                        |                   |                 |               |                   |               | 12:30a                             | .0627        | 1.5743        |
|                                        |                   |                 |               |                   |               | 1:52                               | .0408        | 1.5932        |
|                                        |                   |                 |               |                   |               | 1:41                               | .0211        | 1.6169        |
|                                        |                   |                 |               |                   |               | 3:04                               | .0096        | 1.6370        |
|                                        |                   |                 |               |                   |               | 4:52                               | .0043        | 1.6487        |
|                                        |                   |                 |               |                   |               | 6:24                               | .0024        | 1.6537        |
|                                        |                   |                 |               |                   |               | 9:08                               | .0011        | 1.6581        |
|                                        |                   |                 |               |                   |               | 12:58p                             | .0005        | 1.6610        |

Notes: To convert runoff in in/hr to cfs, multiply by 177.41.



RIESEL (WACO), TEXAS Watershed W-1

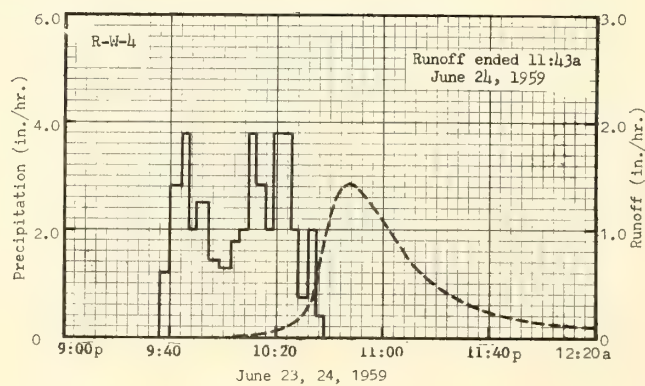
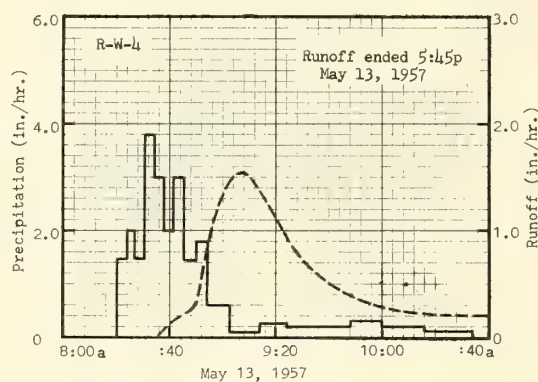
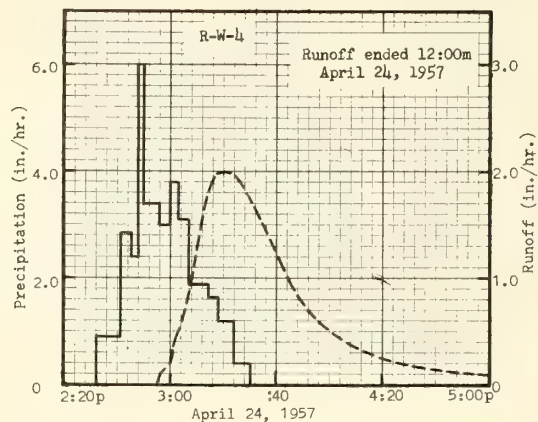
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas Watershed W-2<br>(Area - 130 acres) |              |              |             |              |                |      |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|--------------|----------------------------------------------------------|--------------|--------------|-------------|--------------|----------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                                                             | Jan.              | Feb.            | Mar.                                      | Apr.              | May           | June          | July         | Aug.                                                     | Sept.        | Oct.         | Nov.        | Dec.         | Year           |      |        |      |
| 1955<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.74<br>0         | 2.66<br>0       | 0.38<br>0                                 | 0.74<br>0         | 3.5<br>0      | 1.22<br>0     | 1.18<br>0    | 3.08<br>0                                                | 0<br>0       | 0.24<br>0    | 4.42<br>.19 | 1.87<br>0    | 21.68<br>.19   |      |        |      |
| 1956<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.41<br>0         | 2.86<br>.01     | 5.52<br>.43                               | 15.18<br>9.40     | 7.85<br>5.35  | 4.35<br>.64   | .19<br>.03   | 3.99<br>0                                                | 8.24<br>1.54 | 4.75<br>1.31 | .45<br>.41  |              | 56.03<br>19.02 |      |        |      |
| 1957<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.74<br>.37       | 3.56<br>1.49    | 1.34<br>.39                               | 3.13<br>.29       | 2.26<br>.73   | 2.48<br>.08   | 1.00<br>.01  | 6.57<br>.05                                              | 5.57<br>.41  | 2.65<br>.24  | 1.29<br>.10 | 1.43<br>.07  | 33.02<br>4.23  |      |        |      |
| 1958<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                                                            | .43<br>.05        | 3.46<br>.64     | 1.14<br>.31                               | 4.28<br>.71       | 3.99<br>.46   | 7.09<br>1.58  | 4.96<br>.34  | 3.13<br>.11                                              | 1.70<br>.02  | 7.40<br>1.99 | 1.45<br>.45 | 3.72<br>1.43 | 43.28<br>8.62  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                                                   |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas Watershed W-2                       |              |              |             |              |                |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                                                      | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |              |                                                          |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours      |                                                          | 12 hours     |              | 1 day       |              | 2 days         |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date         | Vol.                                                     | Date         | Vol.         | Date        | Vol.         | Date           | Vol. | Date   | Vol. |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4-19              | 2.82            | 4-19                                      | 2.12              | 4-19          | 2.52          | 5-11         | 3.21                                                     | 5-11         | 3.33         | 5-11        | 3.46         | 4-23           | 4.87 | 4-19   | 8.80 |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5-3               | .11             | 5-3                                       | .09               | 5-3           | .17           | 2-22         | .39                                                      | 2-22         | .61          | 2-22        | 1.02         | 2-22           | 1.16 | 2-21   | 1.28 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | 6-23              | 1.87            | 6-23                                      | .86               | 6-23          | 1.03          | 6-23         | 1.13                                                     | 6-23         | 1.15         | 6-23        | 1.15         | 6-23           | 1.16 | 6-20   | 1.27 |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volumes, excellent. Watershed conditions: conservation practices including terrace systems started in Sept. 1956, completed Sept. 1957. No appreciable change in land use since 1955. Approximately 1/2 of the crop land was in oats and clover and 1/2 in row crops each year; all tillage operations were parallel to the terraces or on the contour. |                   |                 |                                           |                   |               |               |              |                                                          |              |              |             |              |                |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas Watershed W-2                       |              |              |             |              |                |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                 | Rainfall                                  |                   |               | Runoff        |              |                                                          |              |              |             |              |                |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                      | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches)                                            |              |              |             |              |                |      |        |      |
| Event of April 24, 1957                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |                                           |                   |               |               |              |                                                          |              |              |             |              |                |      |        |      |
| 3-27-57                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.89              | 0.0218          | 4-24-57                                   | Rain gauge        | W-4           | 4-24-57       |              |                                                          |              |              |             |              |                |      |        |      |
| 3-28                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0                 | .0065           | 4-24-57                                   |                   | 0             | 2:26p         | 0.0002       |                                                          |              |              |             |              |                |      |        |      |
| 3-31                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.34              | .2221           | 4-24-57                                   | .94               | .14           | 4:40          | .0005        | .0001                                                    |              |              |             |              |                |      |        |      |
| 4-1, 2                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                 |                 | 4-24-57                                   | 2.85              | .33           | 4:49          | .0007        | .0001                                                    |              |              |             |              |                |      |        |      |
| 4-3                                                                                                                                                                                                                                                                                                                                                                                                                                       | .27               | .0002           | 4-24-57                                   | 2.40              | .45           | 4:53          | .0031        | .0003                                                    |              |              |             |              |                |      |        |      |
| 4-4                                                                                                                                                                                                                                                                                                                                                                                                                                       | .01               | 0               | 4-24-57                                   | 6.00              | .65           | 4:55          | .0089        | .0004                                                    |              |              |             |              |                |      |        |      |
| 4-5                                                                                                                                                                                                                                                                                                                                                                                                                                       | .02               | 0               | 4-24-57                                   | 3.40              | .15           | 4:57          | .153         | .0030                                                    |              |              |             |              |                |      |        |      |
| 4-13                                                                                                                                                                                                                                                                                                                                                                                                                                      | .05               | 0               | 4-24-57                                   | 3.00              | 1.19          | 4:59          | .152         | .0088                                                    |              |              |             |              |                |      |        |      |
| 4-15                                                                                                                                                                                                                                                                                                                                                                                                                                      | .02               | 0               | 4-24-57                                   | 3.80              | 1.96          | 5:02          | .413         | .0234                                                    |              |              |             |              |                |      |        |      |
| 4-19                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4.99              | 2.5715          | 4-24-57                                   | 3.15              | 1.59          | 5:04          | .584         | .0399                                                    |              |              |             |              |                |      |        |      |
| 4-20                                                                                                                                                                                                                                                                                                                                                                                                                                      | .23               | .1718           | 4-24-57                                   | 1.89              | 1.71          | 5:08          | 1.15         | .0971                                                    |              |              |             |              |                |      |        |      |
| 4-21                                                                                                                                                                                                                                                                                                                                                                                                                                      | .19               | .0024           | 4-24-57                                   | 1.65              | 1.92          | 5:12          | 1.60         | .1477                                                    |              |              |             |              |                |      |        |      |
| 4-22                                                                                                                                                                                                                                                                                                                                                                                                                                      | .32               | .0156           | 4-24-57                                   | 1.20              | 2.12          | 5:18          | 2.00         | .3742                                                    |              |              |             |              |                |      |        |      |
| 4-23                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.86              | 3.2204          | 4-24-57                                   | .4                | 2.52          | 5:20          | 2.04         | .4418                                                    |              |              |             |              |                |      |        |      |
| 4-24                                                                                                                                                                                                                                                                                                                                                                                                                                      | .04               | .0055           | 4-24-57                                   | Rain gauge        | W-6           | 5:22          | 2.04         | .5101                                                    |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Weighted                                  | Average           | 1.97          | 5:29          | 1.82         | .7379                                                    |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 5:37          | 1.38         | .9529                                                    |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 5:43          | 1.08         | 1.0758                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 5:46          | .927         | 1.1262                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 5:50          | .790         | 1.1837                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 5:58          | .568         | 1.2738                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 6:10          | .361         | 1.3651                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 6:23          | .236         | 1.4283                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 6:42          | .137         | 1.4861                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 6:53          | .105         | 1.5081                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 7:27          | .0547        | 1.5508                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 8:10          | .0308        | 1.5801                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 8:50          | .0077        | 1.6228                                                   |              |              |             |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 12:00m        | .0026        | 1.6366                                                   |              |              |             |              |                |      |        |      |
| Notes: 1. Convert runoff in inches to cfs, multiply by 131.4. 2. Prior to event beginning 2:30p. 3. Thiessen method. See page 42.7-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, CWC, June 1957 (reprinted 1961).                                                                                                                                                                      |                   |                 |                                           |                   |               |               |              |                                                          |              |              |             |              |                |      |        |      |

Cooperative research project of USDA and Texas Agricultural Experiment Station

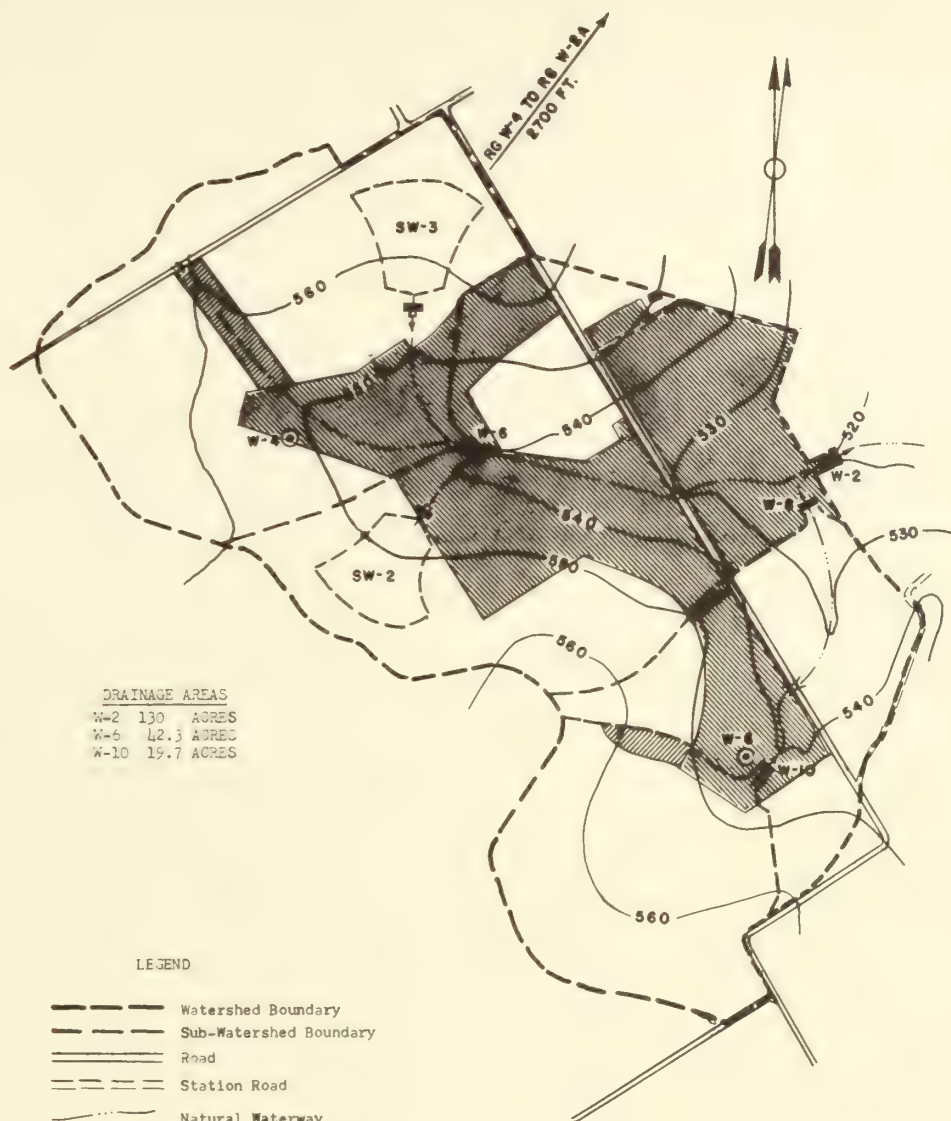
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                 |               |                       |              | Riesel (Waco), Texas Watershed W-2 |              |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-----------------------|--------------|------------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 | Rainfall      |                       |              | Runoff                             |              |               |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr)     | Acc (inches) | Date and time                      | Rate (in/hr) | Acc. (inches) |
| Event of May 12, 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |               |                       |              |                                    |              |               |
| 4-13-57                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.05              | 0               | 5-13-57       | Raingage              | W-4          | 5-13-57                            |              |               |
| 4-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .02               | 0               | 8:20a         | 0                     | 0            | 8:10a                              | 0.0004       | 0             |
| 4-19                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.99              | 2.5715          | :24           | 1.50                  | .10          | :29                                | .0009        | .0002         |
| 4-20                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .23               | .1718           | :27           | 2.00                  | .20          | :36                                | .0118        | .0005         |
| 4-21                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .19               | .0024           | :31           | 1.50                  | .30          | :40                                | .126         | .0053         |
| 4-22                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .32               | .0156           | :34           | 3.80                  | .49          | :45                                | .210         | .0192         |
| 4-23                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.86              | 3.2204          | :38           | 3.00                  | .69          | :49                                | .277         | .0345         |
| 4-24                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2.06              | 1.6421          | :41           | 2.00                  | .79          | :52                                | .616         | .0563         |
| 4-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0                 | .0151           | :45           | 3.00                  | .99          | :54                                | .836         | .0806         |
| 4-26                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.62              | .7890           | :50           | 1.44                  | 1.11         | :58                                | 1.20         | .1488         |
| 4-27                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .29               | .3777           | :54           | 1.80                  | 1.23         | 9:00                               | 1.35         | .1916         |
| 4-28                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.19              | .5011           | 9:03          | .60                   | 1.32         | :03                                | 1.49         | .2631         |
| 4-29                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .06               | .0735           | :14           | .11                   | 1.34         | :06                                | 1.54         | .3390         |
| 4-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .01               | .0072           | :24           | .24                   | 1.38         | :12                                | 1.44         | .4897         |
| 5-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .35               | .0759           | :48           | .20                   | 1.46         | :16                                | 1.28         | .5805         |
| 5-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0                 | .0121           | 10:00         | .30                   | 1.52         | :20                                | 1.11         | .6603         |
| 5-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .52               | .1706           | :16           | .23                   | 1.58         | :24                                | .927         | .7285         |
| 5-4, 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                 | .0334           | :34           | .17                   | 1.63         | :32                                | .658         | .8327         |
| 5-8                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .03               | .0066           | Raingage      | W-6                   | 1.69         | :42                                | .452         | .9241         |
| 5-9                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .86               | .1037           | Weighted      | Average <sup>2/</sup> | 1.65         | :56                                | .302         | 1.0104        |
| 5-10                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0                 | .0116           |               |                       |              | 10:20                              | .219         | 1.1108        |
| 5-11                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.02              | 3.2312          |               |                       |              | 11:00                              | .166         | 1.2430        |
| 5-12 <sup>1/</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                 | .1339           |               |                       |              | :32                                | .0875        | 1.3110        |
| 5-13 <sup>1/</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                 | .0039           |               |                       |              | 12:55p                             | .0240        | 1.3739        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                 |               |                       |              | 2:25                               | .0106        | 1.3991        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                 |               |                       |              | 5:45                               | .0031        | 1.4190        |
| Watershed Conditions: 3% of the area in corn, straight rows; 10% bedded on contour for cotton, no crop; 3% row grain sorghum, terraced, contour tilled; 10% row grain sorghum, unterraced, contour tilled; 4% broadcast sorghum hay; 7% oats-clover, terraced; 28% oats-clover, unterraced, oats in dough stage, clover growing, good growth; 6% native grass meadow, dense growth; 24% Bermuda grass pasture, grass and weeds 10" high, good cover; 5% gravel roads. |                   |                 |               |                       |              |                                    |              |               |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |               |                       |              |                                    |              |               |
| 5-23-59                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.16              | 0.0486          | 6-23-59       | Raingage              | W-4          | 6-23-59                            |              |               |
| 5-24                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .02               | .0126           | 9:36p         | 0                     | 0            | 8:49p                              | 0.0008       | 0             |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1                 | .0119           | :40           | 1.20                  | .08          | :55                                | .0019        | .0001         |
| 5-26, 6-1                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                 | .0627           | :44           | 2.85                  | .27          | 9:03                               | .0031        | .0004         |
| 6-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .25               | .0104           | :47           | 3.80                  | .46          | :22                                | .0031        | .0014         |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .02               | .0096           | :50           | 2.00                  | .56          | :47                                | .0052        | .0031         |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.45              | .0922           | :54           | 2.55                  | .73          | 10:04                              | .0096        | .0054         |
| 6-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .45               | .0303           | :59           | 1.44                  | .85          | :10                                | .0142        | .0066         |
| 6-6, 11                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                 | .0665           | 10:03         | 1.35                  | .94          | :16                                | .0511        | .0093         |
| 6-12                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .24               | .0114           | :06           | 1.80                  | 1.03         | :22                                | .0920        | .0166         |
| 6-13, 19                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                 | .0456           | :09           | 2.00                  | 1.13         | :26                                | .127         | .0239         |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .72               | .0152           | :12           | 3.80                  | 1.32         | :30                                | .219         | .0352         |
| 6-21                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0                 | .0074           | :16           | 2.85                  | 1.51         | :34                                | .428         | .0561         |
| 6-22 <sup>3/</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .28               | .0104           | :19           | 2.00                  | 1.61         | :40                                | 1.12         | .1354         |
| 6-23 <sup>3/</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .84               | .0066           | :25           | 3.80                  | 1.99         | :43                                | 1.36         | .1982         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                 | :28           | 2.00                  | 2.09         | :47                                | 1.42         | .2910         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                 | :32           | .75                   | 2.14         | :51                                | 1.38         | .3843         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                 | :35           | 2.00                  | 2.24         | :57                                | 1.19         | .5133         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                 | :38           | .40                   | 2.26         | 11:04                              | .950         | .6371         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                 | Raingage      | W-2A                  | 1.99         | :08                                | .798         | .6956         |
| Notes: To convert runoff in in/hr to cfs, multiply by 131.04. 1/ Runoff prior to 8:10a. 2/ Thiessen method. 3/ Prior rainfall ended 9:02p.                                                                                                                                                                                                                                                                                                                            |                   |                 |               |                       |              |                                    |              |               |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    | RIESEL (WACO), TEXAS |                      |                  | Watershed W-2    |                 |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |                    | Rainfall             |                      |                  | Runoff           |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 23, 24, 1959 - Continued                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  |                  |                 |                  |
| Watershed Conditions: 3% of<br>area in Johnson grass, mature;<br>4% broadcast sorghum hay in bloom<br>stage; 11% row grain sorghum,<br>terraced, contour tilled; 7% row<br>grain sorghum, unterraced, contour<br>tilled, grain in dough stage; 9%<br>cotton, terraced, contour tilled;<br>4% cotton unterraced, contour<br>tilled, cotton blooming; 9% oats-<br>clover, terraced; 18% oats-clover,<br>unterraced, oats harvested, clover<br>growing, good cover; 6% native grass<br>meadow, dense growth; 24% Bermuda<br>grass pasture with weeds, good<br>cover; 5% gravel roads. |                      |                    | 6-23-59              | Raingage             | W-4              | 6-23-59          |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    | Raingage             | W-6                  | 1.99             | 11:12p           | 0.658           | 0.7443           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    | Weighted             | Average <sup>1</sup> | 2.13             | :18              | .528            | .8037            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | :28              | .354            | .8763            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | :39              | .253            | .9316            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | :50              | .186            | .9716            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | 12:00m           | .146            | .9993            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | 6-24-59          |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | 12:10a           | .118            | 1.0218           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | :15              | .105            | 1.0311           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | :30              | .0741           | 1.0536           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | 1:18             | .0333           | 1.0919           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | 2:43             | .118            | 1.1216           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | 4:00             | .0058           | 1.1336           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | 5:28             | .0032           | 1.1393           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | 7:17             | .0019           | 1.1438           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                      |                      |                  | 11:44            | .0008           | 1.1495           |
| Notes: To convert runoff in in/hr to cfs, multiply by 131.04. <sup>1</sup> / Thiessen method.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                      |                      |                  |                  |                 |                  |





RIESEL (WAO), TEXAS Watershed W-2

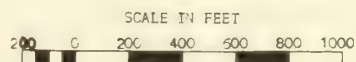


#### DRAINAGE AREAS

|      |      |       |
|------|------|-------|
| W-2  | 130  | ACRES |
| W-6  | 42.3 | ACRES |
| W-10 | 19.7 | ACRES |

#### LEGEND

|  |                                        |
|--|----------------------------------------|
|  | Watershed Boundary                     |
|  | Sub-Watershed Boundary                 |
|  | Road                                   |
|  | Station Road                           |
|  | Natural Waterway                       |
|  | Contours 10 Foot                       |
|  | Small Watershed No. 3                  |
|  | Gaging Station                         |
|  | Recording Raingauge                    |
|  | Permanent Building                     |
|  | Culvert                                |
|  | Permanent Grass Pasture or Hay 1938-59 |
|  | Permanent Grass Pasture or Hay 1956-59 |



RIESEL (WACO), TEXAS

Watersheds W-2, W-6, W-10

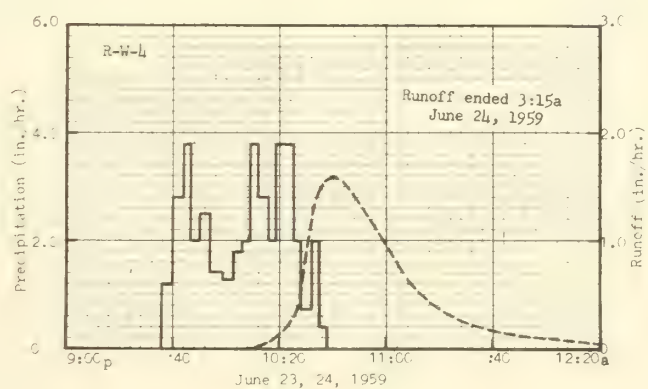
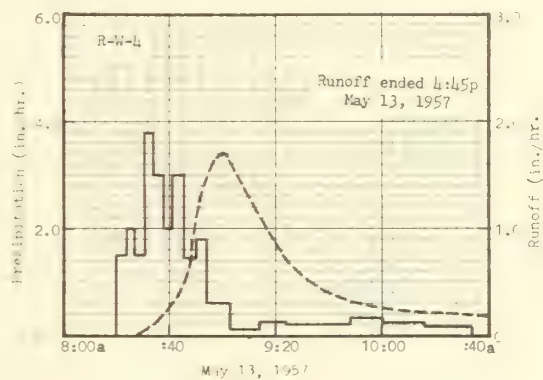
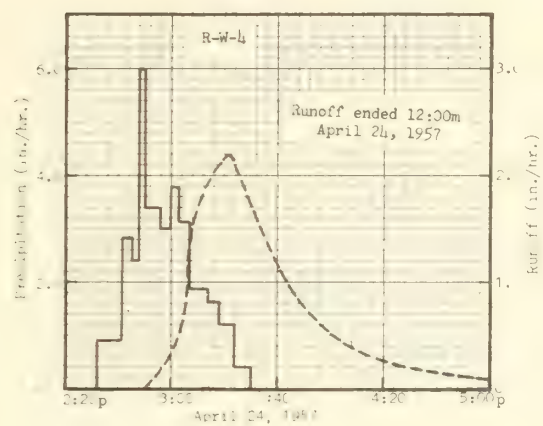
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                              |                   |      |                                           |          |               |                   |               | Riesel (Waco), Texas Watershed W-6<br>(Area - 42.3 acres) |              |      |               |      |        |       |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|----------|---------------|-------------------|---------------|-----------------------------------------------------------|--------------|------|---------------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                                          | Jan.              | Feb. | Mar.                                      | Apr.     | May           | June              | July          | Aug.                                                      | Sept.        | Oct. | Nov.          | Dec. | Year   |       |        |      |
| 1956 P                                                                                                                                                                                                                                                                                                                                                                                                                 | 2.05              | 2.56 | 0.38                                      | 0.76     | 3.85          | 1.19              | 1.07          | 2.89                                                      | 0            | 0.21 | 4.25          | 1.83 | 21.04  |       |        |      |
| Q                                                                                                                                                                                                                                                                                                                                                                                                                      | 0                 | 0    | 0                                         | 0        | 0             | 0                 | 0             | 0                                                         | 0            | 0    | 0             | 0    | 0      |       |        |      |
| 1957 P                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.44              | 2.84 | 5.50                                      | 15.36    | 7.74          | 4.20              | .08           | .83                                                       | 3.90         | 8.13 | 4.68          | .85  | 55.55  |       |        |      |
| Q                                                                                                                                                                                                                                                                                                                                                                                                                      | 0                 | 0    | .49                                       | 9.75     | 5.41          | .88               | .05           | 0                                                         | 0            | 1.34 | .52           | .09  | 18.53  |       |        |      |
| 1958 P                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.74              | 3.51 | 1.35                                      | 3.24     | 2.24          | 2.50              | 1.06          | 6.54                                                      | 5.64         | 2.65 | 1.32          | 1.45 | 33.24  |       |        |      |
| Q                                                                                                                                                                                                                                                                                                                                                                                                                      | .04               | .71  | .05                                       | .03      | .29           | .01               | 0             | T                                                         | .20          | .04  | T             | 0    | 1.37   |       |        |      |
| 1959 P                                                                                                                                                                                                                                                                                                                                                                                                                 | .41               | 3.44 | 1.12                                      | 4.27     | 3.97          | 7.19              | 4.74          | 3.06                                                      | 1.64         | 7.36 | 2.01          | 3.61 | 42.82  |       |        |      |
| Q                                                                                                                                                                                                                                                                                                                                                                                                                      | 0                 | .31  | .05                                       | .28      | .11           | 1.26              | .09           | .01                                                       | 0            | 1.25 | .61           | .50  | 4.47   |       |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                                |                   |      |                                           |          |               |                   |               | Riesel (Waco), Texas Watershed W-6                        |              |      |               |      |        |       |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                                   | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |          |               |                   |               |                                                           |              |      |               |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      | 1 hour                                    |          | 2 hours       |                   | 6 hours       |                                                           | 12 hours     |      | 1 day         |      | 2 days |       | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        | Date              | Rate | Date                                      | Vol.     | Date          | Vol.              | Date          | Vol.                                                      | Date         | Vol. | Date          | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                                   | 4-19              | 3.12 | 4-19                                      | 2.33     | 4-19          | 2.78              | 5-11          | 3.13                                                      | 5-11         | 3.21 | 5-11          | 3.23 | 4-23   | 4.85  | 4-19   | 9.06 |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                   | 2-23              | .09  | 2-23                                      | .07      | 2-23          | .14               | 2-22          | .29                                                       | 2-22         | .42  | 2-22          | .60  | 2-22   | .65   | 2-21   | .69  |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                   | 6-23              | 1.60 | 6-23                                      | .97      | 6-23          | 1.10              | 6-23          | 1.15                                                      | 6-23         | 1.15 | 6-23          | 1.15 | 6-23   | 1.16  | 6-23   | 1.19 |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volumes, excellent. Watershed conditions: conservation practices applied in 1956 consisting of contour cultivation and improved cropping practices. No appreciable change in land use since 1955.* Approximately 1/2 of the crop land in oats and clover and 1/2 in row crops.                                                       |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      |        |       |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |          |               |                   |               | Riesel (Waco), Texas Watershed W-6                        |              |      |               |      |        |       |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                  |                   |      |                                           | Rainfall |               |                   |               | Runoff                                                    |              |      |               |      |        |       |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                   | Rainfall (inches) |      | Runoff (inches)                           |          | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                                             | Rate (in/hr) |      | Acc. (inches) |      |        |       |        |      |
| Event of April 24, 1957                                                                                                                                                                                                                                                                                                                                                                                                |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      |        |       |        |      |
| 3-27-57                                                                                                                                                                                                                                                                                                                                                                                                                | 0.88              |      | 0.030                                     |          | 4-24-57       | Raingage          | W-4           | 4-24-57                                                   |              |      |               |      |        |       |        |      |
| 3-28                                                                                                                                                                                                                                                                                                                                                                                                                   | 0                 |      | .001                                      |          | 2:32p         | 0                 | 0             | 2:46p                                                     | 0.0011       |      | 0             |      |        |       |        |      |
| 3-31                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.38              |      | .262                                      |          | :41           | .94               | .14           | :50                                                       | .0059        |      | T             |      |        |       |        |      |
| 4-1                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                 |      | .004                                      |          | :45           | 2.85              | .33           | :53                                                       | .0495        |      | .001          |      |        |       |        |      |
| 4-3                                                                                                                                                                                                                                                                                                                                                                                                                    | .28               |      | 0                                         |          | :48           | 2.40              | .45           | :56                                                       | .181         |      | .006          |      |        |       |        |      |
| 4-4                                                                                                                                                                                                                                                                                                                                                                                                                    | .01               |      | 0                                         |          | :50           | 6.00              | .65           | 3:00                                                      | .321         |      | .024          |      |        |       |        |      |
| 4-8                                                                                                                                                                                                                                                                                                                                                                                                                    | .02               |      | 0                                         |          | :56           | 3.40              | .99           | :04                                                       | .642         |      | .050          |      |        |       |        |      |
| 4-13                                                                                                                                                                                                                                                                                                                                                                                                                   | .04               |      | 0                                         |          | 3:00          | 3.00              | 1.19          | :06                                                       | 1.33         |      | .084          |      |        |       |        |      |
| 4-15                                                                                                                                                                                                                                                                                                                                                                                                                   | .02               |      | 0                                         |          | :03           | 3.80              | 1.38          | :08                                                       | 1.57         |      | .133          |      |        |       |        |      |
| 4-19                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.07              |      | 2.803                                     |          | :07           | 3.15              | 1.59          | :12                                                       | 1.85         |      | .248          |      |        |       |        |      |
| 4-20                                                                                                                                                                                                                                                                                                                                                                                                                   | .23               |      | .139                                      |          | :14           | 1.89              | 1.81          | :16                                                       | 2.07         |      | .378          |      |        |       |        |      |
| 4-21                                                                                                                                                                                                                                                                                                                                                                                                                   | .21               |      | T                                         |          | :18           | 1.65              | 1.92          | :21                                                       | 2.20         |      | .558          |      |        |       |        |      |
| 4-22                                                                                                                                                                                                                                                                                                                                                                                                                   | .31               |      | .012                                      |          | :24           | 1.20              | 2.02          | :23                                                       | 2.16         |      | .632          |      |        |       |        |      |
| 4-23                                                                                                                                                                                                                                                                                                                                                                                                                   | 3.84              |      | 3.170                                     |          | :30           | .40               | 2.06          | :27                                                       | 1.94         |      | .768          |      |        |       |        |      |
| 4-24 1/2                                                                                                                                                                                                                                                                                                                                                                                                               | .04               |      | .002                                      |          |               |                   |               | :32                                                       | 1.59         |      | .916          |      |        |       |        |      |
| Watershed Conditions: 9% of the area in corn, straight rows, planted mid-March, corn 5" high; 14% bedded on contour for cotton, no crop; 11% row grain sorghum, planted on contour in mid-April, 2" high; 41% oats-clover, oats in bloom stage, good growth; 2% native grass meadow, dense growth; 16% Bermuda grass and weed pasture, grass and weeds 8" high, good cover; 7% gravel roads. No terraces in this area. |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | :36    | 1.37  | 1.014  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | :40    | 1.16  | 1.098  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | :48    | .830  | 1.230  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | :52    | .708  | 1.281  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | :58    | .558  | 1.344  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | 4:05   | .413  | 1.400  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | :14    | .307  | 1.454  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | :28    | .200  | 1.512  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | :46    | .121  | 1.559  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | :51    | .107  | 1.569  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | 5:41   | .0410 | 1.625  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | 6:54   | .0154 | 1.655  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | 8:15   | .0064 | 1.669  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      | 12:00m | .0013 | 1.680  |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 42.64. 1/ Prior to event beginning 2:32p.<br>For map of watershed, see page 42.7-5. * See page 42.8-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, SWC, June 1957 (reprinted 1961).                                                                                                                            |                   |      |                                           |          |               |                   |               |                                                           |              |      |               |      |        |       |        |      |

Cooperative Research Project of USDA and Texas Agricultural Experiment Station

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                            |                   |                 |               |                   |               | Riesel (Waco), Texas Watershed #6 |              |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-------------------|---------------|-----------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                             |                   |                 | Rainfall      |                   |               | Runoff                            |              |               |
| Date                                                                                                                                                                                                                                                                                                                                                                                                              | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                     | Rate (in/hr) | Acc. (inches) |
| Event of May 13, 1957                                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                   |               |                                   |              |               |
| 4-13-57                                                                                                                                                                                                                                                                                                                                                                                                           | 0.04              | 0               | 5-13-57       | Raingage          | W-4           | 5-13-57                           |              |               |
| 4-15                                                                                                                                                                                                                                                                                                                                                                                                              | .02               | 0               | 8:20a         | 0                 | 0             | 8:15a                             | 0.0006       | 0             |
| 4-19                                                                                                                                                                                                                                                                                                                                                                                                              | 5.07              | 2.803           | ±24           | 1.50              | .10           | ±29                               | .0038        | T             |
| 4-20                                                                                                                                                                                                                                                                                                                                                                                                              | .23               | .139            | ±27           | 2.00              | .20           | ±32                               | .0886        | .002          |
| 4-21                                                                                                                                                                                                                                                                                                                                                                                                              | .21               | T               | ±31           | 1.50              | .30           | ±36                               | .141         | .010          |
| 4-22                                                                                                                                                                                                                                                                                                                                                                                                              | .31               | .012            | ±34           | 3.80              | .49           | ±38                               | .181         | .016          |
| 4-23                                                                                                                                                                                                                                                                                                                                                                                                              | 3.84              | 3.170           | ±38           | 3.00              | .69           | ±40                               | .265         | .023          |
| 4-24                                                                                                                                                                                                                                                                                                                                                                                                              | 2.14              | 1.682           | ±41           | 2.00              | .79           | ±44                               | .352         | .044          |
| 4-25                                                                                                                                                                                                                                                                                                                                                                                                              | 0                 | .008            | ±45           | 3.00              | .99           | ±48                               | .699         | .075          |
| 4-26                                                                                                                                                                                                                                                                                                                                                                                                              | 1.59              | .878            | ±50           | 1.44              | 1.11          | ±52                               | 1.33         | .143          |
| 4-27                                                                                                                                                                                                                                                                                                                                                                                                              | .29               | .372            | ±54           | 1.80              | 1.23          | ±56                               | 1.57         | .241          |
| 4-28                                                                                                                                                                                                                                                                                                                                                                                                              | 1.24              | .617            | ±58           | .60               | 1.32          | 9:03                              | 1.64         | .435          |
| 4-29                                                                                                                                                                                                                                                                                                                                                                                                              | .06               | .053            | ±14           | .11               | 1.34          | ±09                               | 1.36         | .585          |
| 4-30                                                                                                                                                                                                                                                                                                                                                                                                              | .01               | .009            | ±24           | .24               | 1.38          | ±11                               | 1.00         | .743          |
| 5-1                                                                                                                                                                                                                                                                                                                                                                                                               | .28               | .019            | ±48           | .20               | 1.46          | ±25                               | .699         | .855          |
| 5-2                                                                                                                                                                                                                                                                                                                                                                                                               | 0                 | .012            | 10:00         | .30               | 1.52          | ±32                               | .516         | .924          |
| 5-3                                                                                                                                                                                                                                                                                                                                                                                                               | .51               | .215            | ±16           | .23               | 1.58          | ±42                               | .366         | .997          |
| 5-4, 7                                                                                                                                                                                                                                                                                                                                                                                                            | 0                 | .060            | ±34           | .17               | 1.63          | ±58                               | .251         | 1.078         |
| 5-8                                                                                                                                                                                                                                                                                                                                                                                                               | .04               | .014            |               |                   |               | 10:09                             | .219         | 1.121         |
| 5-9                                                                                                                                                                                                                                                                                                                                                                                                               | .89               | .092            |               |                   |               | ±24                               | .206         | 1.173         |
| 5-10                                                                                                                                                                                                                                                                                                                                                                                                              | 0                 | .018            |               |                   |               | ±38                               | .181         | 1.218         |
| 5-11                                                                                                                                                                                                                                                                                                                                                                                                              | 3.94              | 3.150           |               |                   |               | 11:15                             | .110         | 1.312         |
| 5-12                                                                                                                                                                                                                                                                                                                                                                                                              | 0                 | .107            |               |                   |               | ±45                               | .0596        | 1.354         |
| 5-13                                                                                                                                                                                                                                                                                                                                                                                                              | 0                 | .005            |               |                   |               | 12:25p                            | .0281        | 1.382         |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |               |                   |               | 2:00                              | .0082        | 1.407         |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |               |                   |               | 4:45                              | .0028        | 1.420         |
| Watershed Conditions: 9% of area in corn, straight rows, cultivated mid-April; 14% bedded on contour for cotton, no crop; 11% grain sorghum contour rows; 41% oats-clover, oats in dough stage, clover growing; 2% native grass meadow, dense growth; 16% Bermuda grass pasture with weeds, good cover; 7% gravel roads. No terraces.                                                                             |                   |                 |               |                   |               |                                   |              |               |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                   |               |                                   |              |               |
| 5-23-59                                                                                                                                                                                                                                                                                                                                                                                                           | 0.20              | 0.004           | 6-23-59       | Raingage          | W-4           | 6-23-59                           |              |               |
| 5-24                                                                                                                                                                                                                                                                                                                                                                                                              | .01               | .003            | 9:36p         | 0                 | 0             | 9:42p                             | 0.0003       | 0             |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                                              | T                 | .002            | ±40           | 1.20              | .08           | ±53                               | .0028        | T             |
| 5-26, 6-1                                                                                                                                                                                                                                                                                                                                                                                                         | 0                 | .012            | ±44           | 2.85              | .27           | ±58                               | .0049        | T             |
| 6-2                                                                                                                                                                                                                                                                                                                                                                                                               | .22               | .002            | ±47           | 3.80              | .46           | 10:05                             | .0082        | .001          |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                                               | .02               | .002            | ±50           | 2.00              | .56           | ±08                               | .0154        | .002          |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                                               | 1.45              | .016            | ±54           | 2.55              | .73           | ±12                               | .0410        | .004          |
| 6-5                                                                                                                                                                                                                                                                                                                                                                                                               | .45               | .005            | ±59           | 1.44              | .85           | ±16                               | .0771        | .007          |
| 6-6, 11                                                                                                                                                                                                                                                                                                                                                                                                           | 0                 | .017            | 10:03         | 1.35              | .94           | ±20                               | .136         | .014          |
| 6-12                                                                                                                                                                                                                                                                                                                                                                                                              | .23               | .004            | ±06           | 1.80              | 1.03          | ±24                               | .314         | .029          |
| 6-13, 19                                                                                                                                                                                                                                                                                                                                                                                                          | 0                 | .015            | ±09           | 2.00              | 1.13          | ±28                               | .497         | .056          |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                                              | .74               | .002            | ±12           | 3.80              | 1.32          | ±32                               | 1.19         | .106          |
| 6-21                                                                                                                                                                                                                                                                                                                                                                                                              | 0                 | .002            | ±16           | 2.85              | 1.51          | ±37                               | 1.56         | .223          |
| 6-22                                                                                                                                                                                                                                                                                                                                                                                                              | .28               | .002            | ±19           | 2.00              | 1.61          | ±40                               | 1.60         | .302          |
| 6-23                                                                                                                                                                                                                                                                                                                                                                                                              | .88               | .002            | ±25           | 3.80              | 1.99          | ±44                               | 1.56         | .408          |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 | ±28           | 2.00              | 2.09          | ±48                               | 1.46         | .508          |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 | ±32           | .75               | 2.14          | ±59                               | 1.00         | .733          |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 | ±35           | 2.00              | 2.24          | 11:07                             | .689         | .845          |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 | ±38           | .40               | 2.26          | ±13                               | .506         | .904          |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |               |                   |               | ±20                               | .373         | .956          |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |               |                   |               | ±30                               | .251         | 1.007         |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |               |                   |               | ±45                               | .14          | 1.055         |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |               |                   |               | ±54                               | .110         | 1.075         |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |               |                   |               | 12:00m                            | .0933        | 1.085         |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |               |                   |               | 6-24-59                           |              |               |
| Watershed Conditions: 11% of area in cotton planted on contour, beginning to bloom, last cultivation mid-June; 14% grain sorghum, contour rows, grain in dough stage, last cultivation mid-May; 41% oats-clover, oats harvested, clover growing; 2% native grass meadow, dense growth; 9% Johnson grass, seed maturing; 16% Bermuda grass pasture, weeds mowed mid-May, good cover; 7% gravel roads. No terraces. |                   |                 |               |                   |               |                                   |              |               |
| Notes: To convert runoff in in/hr to cfs, multiply by 42.64. 1/ Runoff prior to 8:15a.                                                                                                                                                                                                                                                                                                                            |                   |                 |               |                   |               |                                   |              |               |
| 2/ Prior rainfall ended 9:02p.                                                                                                                                                                                                                                                                                                                                                                                    |                   |                 |               |                   |               |                                   |              |               |



| SELECTED RUNOFF EVENTS                                       |                      |                    |                  |                      |                  | Riesel (Waco), Texas Watershed W-6 |                 |                  |
|--------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                        |                      |                    | Rainfall         |                      |                  | Runoff                             |                 |                  |
| Date                                                         | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 23, 24, 1959 - Continued                       |                      |                    |                  |                      |                  | 6-24-59                            |                 |                  |
|                                                              |                      |                    |                  |                      |                  | 12:10a                             | 0.0734          | 1.099            |
|                                                              |                      |                    |                  |                      |                  | :19                                | .0560           | 1.108            |
|                                                              |                      |                    |                  |                      |                  | :49                                | .0260           | 1.128            |
|                                                              |                      |                    |                  |                      |                  | 1:15                               | .0126           | 1.136            |
|                                                              |                      |                    |                  |                      |                  | :45                                | .0064           | 1.140            |
|                                                              |                      |                    |                  |                      |                  | 2:28                               | .0028           | 1.144            |
|                                                              |                      |                    |                  |                      |                  | 3:15                               | .0013           | 1.145            |
| Notes: To convert runoff in in/hr to cfs, multiply by 42.64. |                      |                    |                  |                      |                  |                                    |                 |                  |



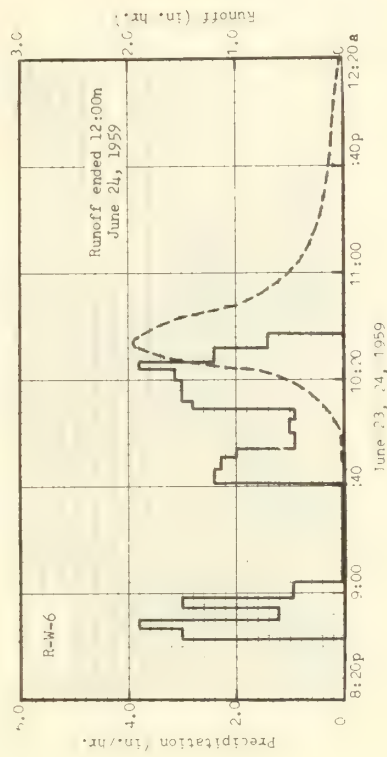
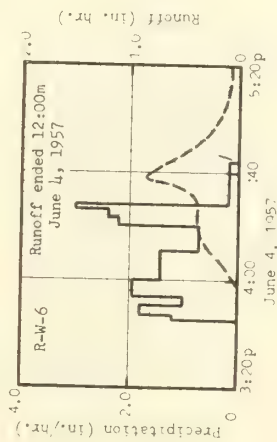
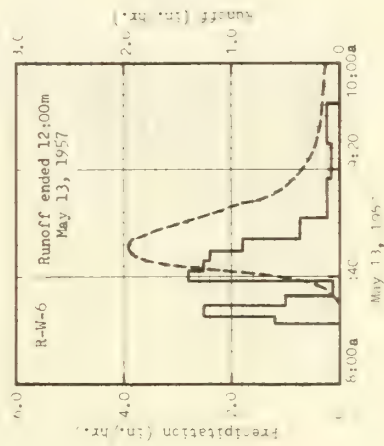
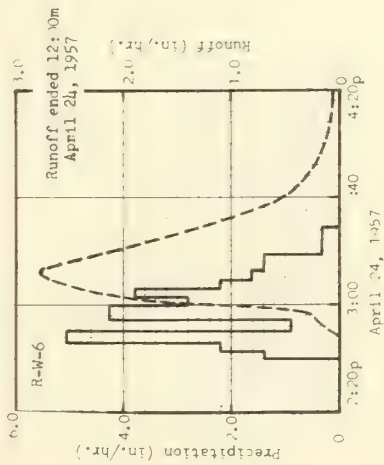
RIESEL (WACO), TEXAS Watershed W-6

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                         |                   |              |                                           |               |               |                   |             | Riesel (Waco), Texas Watershed W-10<br>(Area - 19.7 acres) |             |               |              |              |                |      |        |      |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|-------------------------------------------|---------------|---------------|-------------------|-------------|------------------------------------------------------------|-------------|---------------|--------------|--------------|----------------|------|--------|------|--|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                     | Jan.              | Feb.         | Mar.                                      | Apr.          | May           | June              | July        | Aug.                                                       | Sept.       | Oct.          | Nov.         | Dec.         | Year           |      |        |      |  |
| 1956<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                    | 2.15<br>0         | 2.81<br>0    | 0.38<br>0                                 | 0.70<br>0     | 3.72<br>.04   | 1.28<br>0         | 1.35<br>0   | 3.37<br>0                                                  | 0<br>0      | 0.29<br>0     | 4.67<br>.87  | 1.92<br>0    | 22.64<br>.91   |      |        |      |  |
| 1957<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                    | 1.41<br>0         | 2.90<br>T    | 5.55<br>.49                               | 14.90<br>8.87 | 8.02<br>4.56  | 4.57<br>.63       | .33<br>0    | .74<br>0                                                   | 4.08<br>0   | 8.34<br>2.15  | 4.83<br>.88  | .91<br>0     | 56.58<br>17.58 |      |        |      |  |
| 1958<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                    | 1.75<br>.06       | 3.61<br>1.29 | 1.32<br>.01                               | 3.00<br>.01   | 2.29<br>.49   | 2.47<br>0         | .92<br>0    | 6.62<br>.27                                                | 5.49<br>.72 | 2.66<br>.17   | 1.26<br>0    | 1.41<br>T    | 32.80<br>3.02  |      |        |      |  |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                    | .45<br>0          | 3.49<br>.42  | 1.17<br>.02                               | 4.30<br>.50   | 4.01<br>.12   | 6.99<br>1.42      | 5.24<br>.26 | 3.21<br>.05                                                | 1.75<br>T   | 7.46<br>2.55  | 1.95<br>.55  | 3.84<br>1.17 | 43.86<br>7.06  |      |        |      |  |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                           |                   |              |                                           |               |               |                   |             | Riesel (Waco), Texas Watershed W-10                        |             |               |              |              |                |      |        |      |  |
| YEAR                                                                                                                                                                                                                                                                                                                                                                              | MAXIMUM DISCHARGE |              | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |               |               |                   |             |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              | 1 hour                                    |               | 2 hours       |                   | 6 hours     |                                                            | 12 hours    |               | 1 day        |              | 2 days         |      | 8 days |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   | Date              | Rate         | Date                                      | Vol.          | Date          | Vol.              | Date        | Vol.                                                       | Date        | Vol.          | Date         | Vol.         | Date           | Vol. | Date   | Vol. |  |
| 1957                                                                                                                                                                                                                                                                                                                                                                              | 4-19              | 4.24         | 4-19                                      | 2.31          | 4-19          | 2.55              | 5-11        | 3.00                                                       | 5-11        | 3.02          | 5-11         | 3.02         | 4-23           | 4.43 | 4-19   | 8.29 |  |
| 1958                                                                                                                                                                                                                                                                                                                                                                              | 8-24              | .31          | 8-24                                      | .18           | 8-24          | .22               | 9-19        | .49                                                        | 2-22        | .68           | 2-22         | 1.13         | 2-22           | 1.22 | 2-21   | 1.28 |  |
| 1959                                                                                                                                                                                                                                                                                                                                                                              | 6-23              | 1.96         | 6-23                                      | .98           | 6-23          | 1.14              | 6-23        | 1.21                                                       | 10-4        | 1.47          | 10-4         | 1.75         | 10-4           | 1.82 | 10-4   | 1.83 |  |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volumes, excellent. Watershed conditions: contour cultivation started; grassed waterway constructed in 1956; crop land use changed to 1/2 in oats and clover, 1/4 in cotton, and 1/4 in grain sorghum since 1955* Terrace system constructed Sept. 1957, with tillage parallel to the terraces. |                   |              |                                           |               |               |                   |             |                                                            |             |               |              |              |                |      |        |      |  |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |             | Riesel (Waco), Texas Watershed W-10                        |             |               |              |              |                |      |        |      |  |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                             |                   |              |                                           |               | Rainfall      |                   |             |                                                            |             | Runoff        |              |              |                |      |        |      |  |
| Date                                                                                                                                                                                                                                                                                                                                                                              | Rainfall (inches) |              | Runoff (inches)                           |               | Date and time | Intensity (in/hr) |             | Acc. (inches)                                              |             | Date and time | Rate (in/hr) |              | Acc. (inches)  |      |        |      |  |
| Event of April 24, 1957                                                                                                                                                                                                                                                                                                                                                           |                   |              |                                           |               |               |                   |             |                                                            |             |               |              |              |                |      |        |      |  |
| 3-27-57                                                                                                                                                                                                                                                                                                                                                                           | 0.87              | 0.056        | 4-24-57                                   | Raingage      | W-6           | 4-24-57           |             |                                                            |             |               |              |              |                |      |        |      |  |
| 3-28                                                                                                                                                                                                                                                                                                                                                                              | 0                 | T            | 2:40p                                     | 0             | 0             | 2:44p             | 0           |                                                            |             |               |              |              |                |      |        |      |  |
| 3-31                                                                                                                                                                                                                                                                                                                                                                              | 1.30              | .236         | :43                                       | 1.40          | .07           | :47               | .0010       |                                                            |             |               |              |              |                |      |        |      |  |
| 4-1                                                                                                                                                                                                                                                                                                                                                                               | 0                 | .001         | :46                                       | 2.20          | .18           | :49               | .0079       |                                                            |             |               |              |              |                |      |        |      |  |
| 4-3                                                                                                                                                                                                                                                                                                                                                                               | .26               | 0            | :51                                       | 5.10          | .63           | :51               | .0645       |                                                            |             |               |              |              |                |      |        |      |  |
| 4-4                                                                                                                                                                                                                                                                                                                                                                               | .01               | 0            | :55                                       | .90           | .69           | :53               | .197        |                                                            |             |               |              |              |                |      |        |      |  |
| 4-8                                                                                                                                                                                                                                                                                                                                                                               | .02               | 0            | 3:00                                      | 4.32          | 1.05          | :55               | .310        |                                                            |             |               |              |              |                |      |        |      |  |
| 4-13                                                                                                                                                                                                                                                                                                                                                                              | .06               | 0            | :03                                       | 2.80          | 1.19          | :56               | .234        |                                                            |             |               |              |              |                |      |        |      |  |
| 4-15                                                                                                                                                                                                                                                                                                                                                                              | .02               | 0            | :06                                       | 3.80          | 1.38          | :57               | .288        |                                                            |             |               |              |              |                |      |        |      |  |
| 4-19                                                                                                                                                                                                                                                                                                                                                                              | 4.86              | 2.577        | :09                                       | 2.20          | 1.49          | 3:00              | 1.05        |                                                            |             |               |              |              |                |      |        |      |  |
| 4-20                                                                                                                                                                                                                                                                                                                                                                              | .24               | .070         | :13                                       | 1.65          | 1.60          | :03               | 2.19        |                                                            |             |               |              |              |                |      |        |      |  |
| 4-21                                                                                                                                                                                                                                                                                                                                                                              | .15               | 0            | :19                                       | 1.40          | 1.74          | :08               | 2.58        |                                                            |             |               |              |              |                |      |        |      |  |
| 4-22                                                                                                                                                                                                                                                                                                                                                                              | .33               | .009         | :29                                       | .36           | 1.80          | :12               | 2.79        |                                                            |             |               |              |              |                |      |        |      |  |
| 4-23                                                                                                                                                                                                                                                                                                                                                                              | 3.89              | 2.960        |                                           |               |               | :17               | 2.48        |                                                            |             |               |              |              |                |      |        |      |  |
| 4-24 1/2                                                                                                                                                                                                                                                                                                                                                                          | .08               | 0            |                                           |               |               | :24               | 1.74        |                                                            |             |               |              |              |                |      |        |      |  |
| Watershed Conditions: 25% of area bedded on contour for cotton, no crop; 25% grain sorghum, rows on contour, planted mid-April, 3" high; 48% oats-clover, oats in bloom stage; 2% Bermuda grass pasture, good cover.                                                                                                                                                              |                   |              |                                           |               |               |                   |             |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | :29               | 1.24        |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | :34               | .942        |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | :39               | .605        |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | :44               | .383        |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | :48               | .300        |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | :52               | .207        |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | 4:04              | .126        |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | :16               | .0754       |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | :39               | .0358       |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | 5:18              | .0173       |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | 6:00              | .0079       |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | :40               | .0042       |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | 7:58              | .0018       |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | 10:41             | .0005       |                                                            |             |               |              |              |                |      |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                   |                   |              |                                           |               |               | 12:00m            | .0001       |                                                            |             |               |              |              |                |      |        |      |  |
| Notes: To convert runoff in in/hr to cfs, multiply by 19.86. 1/ Prior to event beginning 2:40p. For map of watershed, see page 42.7-5. * See page 42.10-1, Monthly precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, SMC, June 1957 (reprinted in 1961).                                                                                      |                   |              |                                           |               |               |                   |             |                                                            |             |               |              |              |                |      |        |      |  |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                         |                   |                 | Riesel (Waco), Texas |                   |               | Watershed W-10 |              |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|----------------------|-------------------|---------------|----------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                          |                   |                 | Rainfall             |                   |               | Runoff         |              |               |
| Date                                                                                                                                                                                                                                           | Rainfall (inches) | Runoff (inches) | Date and time        | Intensity (in/hr) | Acc. (inches) | Date and time  | Rate (in/hr) | Acc. (inches) |
| Event of May 13, 1957                                                                                                                                                                                                                          |                   |                 |                      |                   |               |                |              |               |
| 4-13-57                                                                                                                                                                                                                                        | 0.06              | 0               | 5-13-57              | Raingage          | W-6           | 5-13-57        |              |               |
| 4-19                                                                                                                                                                                                                                           | .02               | 0               | 8:22a                |                   | 0             | 8:27a          | 0            | 0             |
| 4-19                                                                                                                                                                                                                                           | 4.86              | 2.577           | :25                  | 1.20              | .06           | :30            | .0091        | T             |
| 4-20                                                                                                                                                                                                                                           | .24               | .070            | :29                  | 2.55              | .23           | :32            | .0326        | .001          |
| 4-21                                                                                                                                                                                                                                           | .15               | 0               | :33                  | 1.05              | .30           | :36            | .126         | .006          |
| 4-22                                                                                                                                                                                                                                           | .33               | .009            | :39                  | .10               | .66           | :42            | 1.03         | .059          |
| 4-23                                                                                                                                                                                                                                           | 3.89              | 2.960           | :42                  | 2.80              | .80           | :45            | 1.83         | .158          |
| 4-24                                                                                                                                                                                                                                           | 1.94              | 1.466           | :46                  | 2.55              | .97           | :50            | 1.98         | .290          |
| 4-25                                                                                                                                                                                                                                           | 0                 | .001            | :49                  | 2.40              | 1.09          | :55            | 1.89         | .456          |
| 4-26                                                                                                                                                                                                                                           | 1.66              | .893            | :54                  | 1.80              | 1.24          | :58            | 1.65         | .547          |
| 4-27                                                                                                                                                                                                                                           | .28               | .319            | 9:02                 | .75               | 1.34          | 4:00           | 1.45         | .600          |
| 4-28                                                                                                                                                                                                                                           | 1.11              | .551            | :17                  | .24               | 1.40          | :04            | 1.14         | .689          |
| 4-29                                                                                                                                                                                                                                           | .06               | .023            | :31                  | .18               | 1.44          | :08            | .11          | .759          |
| 4-30                                                                                                                                                                                                                                           | .01               | 0               | :45                  | .24               | 1.50          | :22            | .299         | .904          |
| 5-1                                                                                                                                                                                                                                            | .46               | .14             |                      |                   |               | :40            | .175         | .971          |
| 5-2                                                                                                                                                                                                                                            | 0                 | .001            |                      |                   |               | 11:05          | .0868        | 1.172         |
| 5-3                                                                                                                                                                                                                                            | .53               | .097            |                      |                   |               | :19            | .0428        | 1.187         |
| 5-4                                                                                                                                                                                                                                            | 0                 | .001            |                      |                   |               | :34            | .0217        | 1.195         |
| 5-8                                                                                                                                                                                                                                            | .02               | 0               |                      |                   |               | :52            | .0105        | 1.200         |
| 5-9                                                                                                                                                                                                                                            | .80               | .080            |                      |                   |               | 12:21p         | .0059        | 1.204         |
| 5-11                                                                                                                                                                                                                                           | 4.14              | 3.005           |                      |                   |               | 1:05           | .0028        | 1.207         |
| 5-12                                                                                                                                                                                                                                           | 0                 | .019            |                      |                   |               | 2:52           | .0010        | 1.210         |
|                                                                                                                                                                                                                                                |                   |                 |                      |                   |               | 12:00m         | T            | 1.212         |
| Watershed Conditions: 25% of area bedded on contour for cotton, no crop; 25% grain sorghum, contour rows; 48% oats-clover, oats in dough stage; 2% bermuda grass pasture, good cover.                                                          |                   |                 |                      |                   |               |                |              |               |
| Event of June 4, 1957                                                                                                                                                                                                                          |                   |                 |                      |                   |               |                |              |               |
| 5-4-57                                                                                                                                                                                                                                         | 0                 | 0.001           | 6-4-57               | Raingage          | W-6           | 6-4-57         |              |               |
| 5-8                                                                                                                                                                                                                                            | .02               | 0               | 3:45p                | 0                 | 0             | 3:50p          | 0            | 0             |
| 5-9                                                                                                                                                                                                                                            | .80               | .080            | :47                  | 1.20              | .04           | :54            | .0010        | T             |
| 5-11                                                                                                                                                                                                                                           | 4.14              | 3.005           | :50                  | 1.80              | .13           | :58            | .0091        | T             |
| 5-12                                                                                                                                                                                                                                           | 0                 | .019            | :53                  | 1.00              | .18           | 4:00           | .0217        | .001          |
| 5-13                                                                                                                                                                                                                                           | 1.73              | 1.212           | 4:00                 | 1.98              | .41           | :04            | .0927        | .004          |
| 5-14                                                                                                                                                                                                                                           | 0                 | T               | :11                  | 1.45              | .68           | :07            | .178         | .011          |
| 5-16                                                                                                                                                                                                                                           | .08               | 0               | :20                  | .74               | .79           | :11            | .277         | .026          |
| 5-18                                                                                                                                                                                                                                           | .03               | 0               | :23                  | 2.20              | .90           | :16            | .359         | .052          |
| 5-23                                                                                                                                                                                                                                           | .13               | 0               | :26                  | 2.40              | 1.02          | :22            | .371         | .091          |
| 5-25                                                                                                                                                                                                                                           | T                 | 0               | :28                  | 3.00              | 1.12          | :33            | .469         | .170          |
| 5-26                                                                                                                                                                                                                                           | .10               | 0               | :44                  | .15               | 1.16          | :35            | .635         | .189          |
| 6-1                                                                                                                                                                                                                                            | 1.10              | .049            |                      |                   |               | :38            | .853         | .228          |
| 6-3                                                                                                                                                                                                                                            | .53               | .010            |                      |                   |               | :43            | .694         | .295          |
| 6-4 1/2                                                                                                                                                                                                                                        | .10               | T               |                      |                   |               | :47            | .462         | .335          |
|                                                                                                                                                                                                                                                |                   |                 |                      |                   |               | :55            | .266         | .383          |
|                                                                                                                                                                                                                                                |                   |                 |                      |                   |               | 5:00           | .163         | .402          |
|                                                                                                                                                                                                                                                |                   |                 |                      |                   |               | :10            | .0987        | .424          |
|                                                                                                                                                                                                                                                |                   |                 |                      |                   |               | :16            | .0754        | .433          |
|                                                                                                                                                                                                                                                |                   |                 |                      |                   |               | :43            | .0267        | .453          |
|                                                                                                                                                                                                                                                |                   |                 |                      |                   |               | 6:17           | .0105        | .463          |
|                                                                                                                                                                                                                                                |                   |                 |                      |                   |               | 7:52           | .0050        | .472          |
|                                                                                                                                                                                                                                                |                   |                 |                      |                   |               | 12:00m         | .0008        | .481          |
| Watershed Conditions: 25% of area in cotton planted on contour last of May, cotton up; 25% grain sorghum, contour rows, cultivated mid-May; 48% oats-clover, oats harvested last of May, clover growing; 2% bermuda grass pasture, good cover. |                   |                 |                      |                   |               |                |              |               |
| Notes: To convert runoff in in/hr to cfs, multiply by 19.86. 1/ Prior to event beginning 3:45p.                                                                                                                                                |                   |                 |                      |                   |               |                |              |               |



| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                |                      |                    |                  |                      |                  | Riesel (Waco), Texas Watershed W-10 |                 |                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|-------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                 |                      |                    | Rainfall         |                      |                  | Runoff                              |                 |                  |
| Date                                                                                                                                                                                                                                                                                  | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                    | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                                            |                      |                    |                  |                      |                  |                                     |                 |                  |
| 5-23-59                                                                                                                                                                                                                                                                               | 0.12                 | 0.044              | 6-23-59          | Raingage             | W-6              | 6-23-59                             |                 |                  |
| 5-24                                                                                                                                                                                                                                                                                  | .02                  | .001               | 8:43p            | 0                    | 0                | 9:30p                               | 0               | 0                |
| 5-25                                                                                                                                                                                                                                                                                  | .01                  | T                  | :47              | 3.00                 | .20              | :39                                 | .0018           | T                |
| 6-1                                                                                                                                                                                                                                                                                   | .29                  | 0                  | :50              | 3.80                 | .39              | :49                                 | .0079           | .001             |
| 6-3                                                                                                                                                                                                                                                                                   | .02                  | 0                  | :55              | 1.20                 | .49              | 10:00                               | .0267           | .004             |
| 6-4                                                                                                                                                                                                                                                                                   | 1.46                 | .119               | :59              | 3.00                 | .69              | :03                                 | .0595           | .006             |
| 6-5                                                                                                                                                                                                                                                                                   | .44                  | .025               | 9:04             | .96                  | .77              | :06                                 | .0987           | .010             |
| 6-6, 7                                                                                                                                                                                                                                                                                | 0                    | .004               | :41              | .03                  | .79              | :09                                 | .159            | .017             |
| 6-12                                                                                                                                                                                                                                                                                  | .25                  | 0                  | :46              | 2.40                 | .99              | :13                                 | .258            | .031             |
| 6-20                                                                                                                                                                                                                                                                                  | .70                  | 0                  | :51              | 2.28                 | 1.18             | :18                                 | .409            | .059             |
| 6-22                                                                                                                                                                                                                                                                                  | .28                  | 0                  | :54              | 2.00                 | 1.28             | :24                                 | 1.05            | .131             |
| Watershed Conditions: 23% of area in cotton, beginning to bloom, cultivated first of June; 23% row grain sorghum, grain in dough stage, cultivated mid-May; 52% oats-clover, oats harvested, clover growing; 2% Bermuda grass pasture, good cover; cropland terraced, contour tilled. |                      |                    | 10:00            | .90                  | 1.37             | :28                                 | 1.54            | .220             |
|                                                                                                                                                                                                                                                                                       |                      |                    | :05              | 1.08                 | 1.46             | :30                                 | 1.78            | .276             |
|                                                                                                                                                                                                                                                                                       |                      |                    | :09              | .90                  | 1.52             | :33                                 | 1.96            | .371             |
|                                                                                                                                                                                                                                                                                       |                      |                    | :12              | 2.80                 | 1.66             | :40                                 | 1.71            | .594             |
|                                                                                                                                                                                                                                                                                       |                      |                    | :20              | 3.00                 | 2.06             | :44                                 | 1.42            | .699             |
|                                                                                                                                                                                                                                                                                       |                      |                    | :24              | 3.15                 | 2.27             | :48                                 | 1.07            | .784             |
|                                                                                                                                                                                                                                                                                       |                      |                    | :27              | 3.80                 | 2.46             | :55                                 | .679            | .886             |
|                                                                                                                                                                                                                                                                                       |                      |                    | :32              | 2.40                 | 2.66             | 11:01                               | .462            | .943             |
|                                                                                                                                                                                                                                                                                       |                      |                    | :37              | 1.44                 | 2.78             | :11                                 | .310            | 1.006            |
|                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :38                                 | .141            | 1.104            |
|                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | 12:00m                              | .0838           | 1.146            |
|                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | 6-24-59                             |                 |                  |
|                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | 12:14a                              | .0550           | 1.162            |
|                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :51                                 | .0217           | 1.185            |
|                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | 1:30                                | .0105           | 1.195            |
|                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | 2:28                                | .0042           | 1.202            |
|                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | 4:55                                | .0010           | 1.207            |
|                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | 12:00n                              | T               | 1.210            |
| Notes: To convert runoff in in/hr to cfs, multiply by 19.86.                                                                                                                                                                                                                          |                      |                    |                  |                      |                  |                                     |                 |                  |

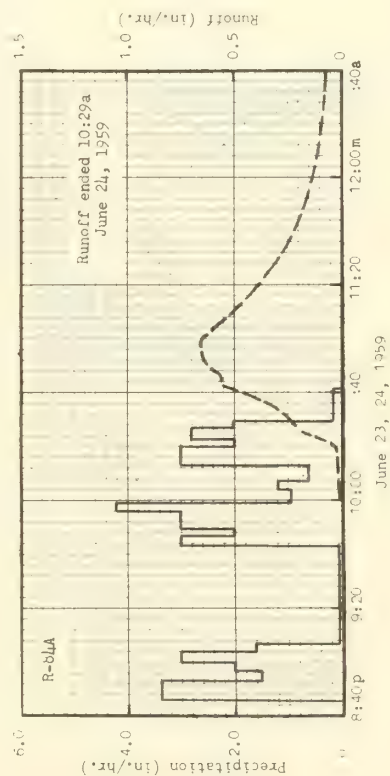
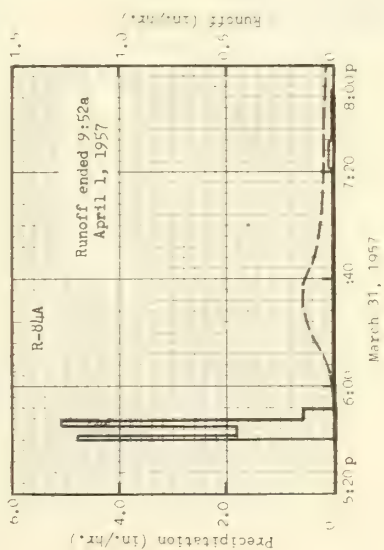
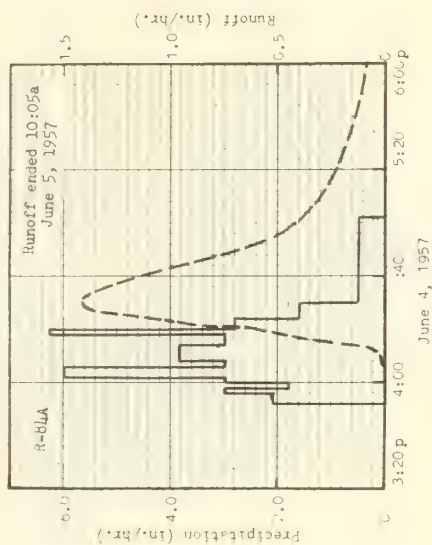


| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                  |                      |                    |                                           |                      |                  |                  |                 | Riesel (Waco), Texas Watershed Y<br>(Area - 309 acres) |             |              |              |             |                |      |        |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|--------------------------------------------------------|-------------|--------------|--------------|-------------|----------------|------|--------|--------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                              | Jan.                 | Feb.               | Mar.                                      | Apr.                 | May              | June             | July            | Aug.                                                   | Sept.       | Oct.         | Nov.         | Dec.        | Year           |      |        |        |
| 1956 P<br>Q                                                                                                                                                                                                                                                                                                                                | 2.16<br>0            | 2.37<br>0          | 0.39<br>0                                 | 0.65<br>0            | 4.44<br>0        | 1.91<br>0        | 2.03<br>0       | 2.54<br>T                                              | 0<br>0      | 0.39<br>0    | 4.47<br>.07  | 2.01<br>0   | 23.36<br>.07   |      |        |        |
| 1957 P<br>Q                                                                                                                                                                                                                                                                                                                                | 1.52<br>0            | 3.19<br>.02        | 5.49<br>.46                               | 14.76<br>10.21       | 8.39<br>5.48     | 4.86<br>1.10     | .03<br>C        | 1.10<br>0                                              | 4.09<br>0   | 8.21<br>1.31 | 4.60<br>1.06 | .87<br>.04  | 57.11<br>19.68 |      |        |        |
| 1958 P<br>Q                                                                                                                                                                                                                                                                                                                                | 1.78<br>.12          | 3.39<br>1.08       | 1.37<br>.12                               | 3.27<br>.04          | 1.94<br>.52      | 2.36<br>0        | 1.03<br>0       | 6.36<br>.05                                            | 4.94<br>.17 | 2.92<br>.11  | 1.40<br>.01  | 1.42<br>.01 | 32.18<br>2.23  |      |        |        |
| 1959 P<br>Q                                                                                                                                                                                                                                                                                                                                | .38<br>.01           | 3.33<br>.47        | .98<br>.02                                | 4.02<br>.41          | 4.04<br>.22      | 7.23<br>1.10     | 4.35<br>.06     | 3.12<br>T                                              | 1.90<br>T   | 6.91<br>.97  | 1.98<br>.56  | 3.55<br>.81 | 41.79<br>4.63  |      |        |        |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  |                  |                 | Riesel (Waco), Texas Watershed Y                       |             |              |              |             |                |      |        |        |
| YEAR                                                                                                                                                                                                                                                                                                                                       | MAXIMUM<br>DISCHARGE |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                                                        |             |              |              |             |                |      |        |        |
|                                                                                                                                                                                                                                                                                                                                            |                      |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                                                        | 12 hours    |              | 1 day        |             | 2 days         |      | 8 days |        |
|                                                                                                                                                                                                                                                                                                                                            | Date                 | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.                                                   | Date        | Vol.         | Date         | Vol.        | Date           | Vol. | Date   | Vol.   |
| 1957                                                                                                                                                                                                                                                                                                                                       | 4-19                 | e 2.54             | 4-19                                      | 2.15                 | 4-19             | e 2.74           | 4-19            | e 3.48                                                 | 4-19        | e 3.66       | 4-19         | e 3.70      | 4-23           | 4.65 | 4-19   | e 9.36 |
| 1958                                                                                                                                                                                                                                                                                                                                       | 5-3                  | .11                | 5-3                                       | .10                  | 5-3              | .19              | 2-23            | .34                                                    | 2-22        | .54          | 2-22         | .85         | 2-22           | .98  | 2-21   | 1.04   |
| 1959                                                                                                                                                                                                                                                                                                                                       | 6-23                 | .57                | 6-23                                      | .50                  | 6-23             | .67              | 6-23            | .78                                                    | 6-23        | .80          | 6-23         | .81         | 6-23           | .90  | 6-22   | .91    |
| Notes: Quality of records: monthly P and Q, good; Annual Max. discharges and volumes, good. Watershed conditions: no appreciable change in land use or conservation practices since 1955. See page 42.11-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, SWC, June 1957 (reprinted 1961). |                      |                    |                                           |                      |                  |                  |                 |                                                        |             |              |              |             |                |      |        |        |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                     |                      |                    |                                           |                      |                  |                  |                 | Riesel (Waco), Texas Watershed Y                       |             |              |              |             |                |      |        |        |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                      |                      |                    | Rainfall                                  |                      |                  |                  |                 | Runoff                                                 |             |              |              |             |                |      |        |        |
| Date                                                                                                                                                                                                                                                                                                                                       | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches)                                       |             |              |              |             |                |      |        |        |
| Event of March 31 - April 1, 1957                                                                                                                                                                                                                                                                                                          |                      |                    |                                           |                      |                  |                  |                 |                                                        |             |              |              |             |                |      |        |        |
| 3-2-57                                                                                                                                                                                                                                                                                                                                     | 0.14                 | 0                  | 3-31-57                                   | Raingage             | 84A              | 3-31-57          |                 |                                                        |             |              |              |             |                |      |        |        |
| 3-6                                                                                                                                                                                                                                                                                                                                        | .82                  | 0                  | 5:40p                                     | 0                    | 0                | 5:31p            | 0.0024          | 0                                                      |             |              |              |             |                |      |        |        |
| 3-11                                                                                                                                                                                                                                                                                                                                       | .94                  | .0012              | :42                                       | 4.80                 | .16              | :50              | .0096           | .0011                                                  |             |              |              |             |                |      |        |        |
| 3-12, 16                                                                                                                                                                                                                                                                                                                                   | 0                    | T                  | :45                                       | 1.80                 | .25              | 6:01             | .0179           | .0037                                                  |             |              |              |             |                |      |        |        |
| 3-17                                                                                                                                                                                                                                                                                                                                       | .22                  | T                  | :47                                       | 5.10                 | .42              | :07              | .0357           | .0064                                                  |             |              |              |             |                |      |        |        |
| 3-20                                                                                                                                                                                                                                                                                                                                       | 1.88                 | .1668              | :51                                       | .60                  | .46              | :13              | .0512           | .0106                                                  |             |              |              |             |                |      |        |        |
| 3-21, 22                                                                                                                                                                                                                                                                                                                                   | 0                    | .0327              | 7:21                                      | .03                  | .50              | :16              | .0930           | .0142                                                  |             |              |              |             |                |      |        |        |
| 3-23                                                                                                                                                                                                                                                                                                                                       | T                    | 0                  | :31                                       | .12                  | .52              | :21              | .119            | .0233                                                  |             |              |              |             |                |      |        |        |
| 3-24, 26                                                                                                                                                                                                                                                                                                                                   | 0                    | T                  | :51                                       | .06                  | .54              | :35              | .150            | .0551                                                  |             |              |              |             |                |      |        |        |
| 3-27                                                                                                                                                                                                                                                                                                                                       | .97                  | .0269              | Raingage                                  | 69                   | .70              | :44              | .113            | .0752                                                  |             |              |              |             |                |      |        |        |
| 3-28, 29                                                                                                                                                                                                                                                                                                                                   | 0                    | .0062              | Raingage                                  | 70                   | .49              | :53              | .0930           | .0909                                                  |             |              |              |             |                |      |        |        |
| 3-31                                                                                                                                                                                                                                                                                                                                       | .75 1/               | .0143 2/           | Raingage                                  | 75A                  | .33              | 7:02             | .0762           | .1037                                                  |             |              |              |             |                |      |        |        |
| Watershed Conditions: 7% corn, planted second week March (no crop growing); 38% bedded, no crop; 1% oats 10" high; 19% oats-clover, oats 10" high, good cover; 34% Bermuda and native grass pasture with burr clover and weeds, good cover; 1% in farmstead and gravel roads, cultivated land terraced, contour tilled.                    |                      |                    | Raingage                                  | 89                   | .61              | :11              | .0623           | .1143                                                  |             |              |              |             |                |      |        |        |
|                                                                                                                                                                                                                                                                                                                                            |                      |                    | Raingage                                  | W-2A                 | .67              | 8:24             | .0275           | .1649                                                  |             |              |              |             |                |      |        |        |
|                                                                                                                                                                                                                                                                                                                                            |                      |                    | Weighted                                  | Average 3/           | .51              | 10:02            | .0123           | .1959                                                  |             |              |              |             |                |      |        |        |
|                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      | 12:00m           | .0059            | .2128           |                                                        |             |              |              |             |                |      |        |        |
|                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      | 4-1-57           |                  |                 |                                                        |             |              |              |             |                |      |        |        |
|                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  | 4:14a            | .0021           | .2278                                                  |             |              |              |             |                |      |        |        |
|                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  | 9:52             | .0009           | .2357                                                  |             |              |              |             |                |      |        |        |
| Event of April 24, 25, 1957                                                                                                                                                                                                                                                                                                                |                      |                    |                                           |                      |                  |                  |                 |                                                        |             |              |              |             |                |      |        |        |
| 3-24-57                                                                                                                                                                                                                                                                                                                                    | 0                    | T                  | 4-24-57                                   | Raingage             | 84A              | 4-24-57          |                 |                                                        |             |              |              |             |                |      |        |        |
| 3-27                                                                                                                                                                                                                                                                                                                                       | .97                  | .0269              | 2:33p                                     | 0                    | 0                | 1:30p            | 0.0006          | 0                                                      |             |              |              |             |                |      |        |        |
| 3-28-29                                                                                                                                                                                                                                                                                                                                    | 0                    | .0062              | :39                                       | .50                  | .05              | 2:33             | .0007           | .0006                                                  |             |              |              |             |                |      |        |        |
| 3-31                                                                                                                                                                                                                                                                                                                                       | 1.27                 | .2271              | :43                                       | 1.50                 | .15              | :45              | .0017           | .0008                                                  |             |              |              |             |                |      |        |        |
| 4-1, 2                                                                                                                                                                                                                                                                                                                                     | 0                    | .0284              | :48                                       | 2.52                 | .36              | :48              | .0033           | .0010                                                  |             |              |              |             |                |      |        |        |
| 4-3                                                                                                                                                                                                                                                                                                                                        | .26                  | .0011              | :51                                       | 4.00                 | .56              | :51              | .0077           | .0012                                                  |             |              |              |             |                |      |        |        |
| 4-4                                                                                                                                                                                                                                                                                                                                        | .02                  | .0002              | :58                                       | 2.31                 | .83              | :54              | .0144           | .0018                                                  |             |              |              |             |                |      |        |        |
| 4-5, 7                                                                                                                                                                                                                                                                                                                                     | 0                    | T                  | 3:01                                      | 3.20                 | .99              | :56              | .0204           | .0024                                                  |             |              |              |             |                |      |        |        |
| 4-8                                                                                                                                                                                                                                                                                                                                        | .03                  | T                  | :08                                       | 2.31                 | 1.26             | :57              | .0283           | .0028                                                  |             |              |              |             |                |      |        |        |
| 4-9                                                                                                                                                                                                                                                                                                                                        | 0                    | T                  | :14                                       | 1.50                 | 1.41             | :58              | .0512           | .0035                                                  |             |              |              |             |                |      |        |        |
| Notes: To convert runoff in in/hr to cfs, multiply by 311.57. 1/ Prior precipitation ended 1:41p. 2/ Runoff prior to 5:31p. 3/ Thiessen method.                                                                                                                                                                                            |                      |                    |                                           |                      |                  |                  |                 |                                                        |             |              |              |             |                |      |        |        |

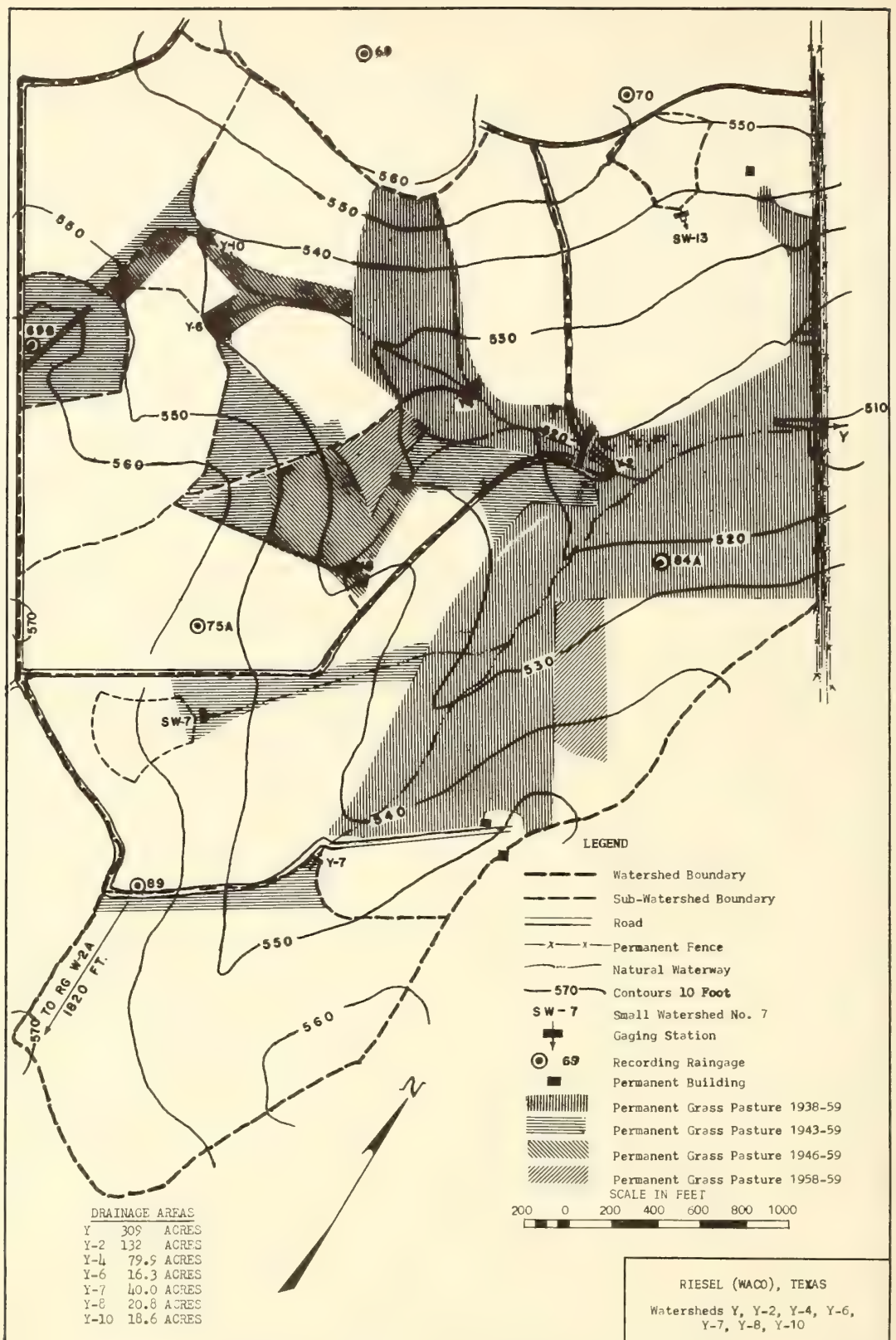
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                          |                   |                 | Riesel (Waco), Texas Watershed Y |                   |               |               |              |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|----------------------------------|-------------------|---------------|---------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | Rainfall                         |                   |               | Runoff        |              |               |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                            | Rainfall (inches) | Runoff (inches) | Date and time                    | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches) |
| Event of April 24, 25, 1957 - Continued                                                                                                                                                                                                                                                                                                                                                                                         |                   |                 |                                  |                   |               |               |              |               |
| 4-13-57                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.05              | 0               | 4-24-57                          |                   |               | 4-24-59       |              |               |
| 4-18                                                                                                                                                                                                                                                                                                                                                                                                                            | .03               | 0               | 3:20p                            | 0.80              | 1.49          | 2:50p         | 0.0977       | 0.0047        |
| 4-19                                                                                                                                                                                                                                                                                                                                                                                                                            | 5.06              | 2.8003          | 3:32                             | .90               | 1.55          | 3:00          | .143         | .0068         |
| 4-20                                                                                                                                                                                                                                                                                                                                                                                                                            | .27               | .9034           | 4:18                             | .03               | 1.57          | 3:01          | .211         | .0098         |
| 4-21                                                                                                                                                                                                                                                                                                                                                                                                                            | .21               | .0095           | 4:18                             |                   | 1.60          | 3:02          | .296         | .0141         |
| 4-22                                                                                                                                                                                                                                                                                                                                                                                                                            | .32               | .0436           | Raingage                         |                   | 1.81          | 3:03          | .398         | .0200         |
| 4-23                                                                                                                                                                                                                                                                                                                                                                                                                            | 3.83              | 2.7867          | Raingage                         | 70                | 1.77          | 3:04          | .455         | .0272         |
| 4-24                                                                                                                                                                                                                                                                                                                                                                                                                            | .03               | .0097           | Raingage                         | 75A               | 1.84          | 3:05          | .500         | .0353         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 | Raingage                         |                   | 1.81          | 3:09          | .661         | .0749         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 | Raingage                         | W-2A              | 1.79          | 3:10          | .743         | .0868         |
| Watershed Conditions: 1% in corn, fair stand 3" high; 2% seeded for cotton, no crop; 11% row grain sorghum 2" high; 4% row Sudan 1" high, sorghum and Sudan planted mid-April; 1% oats in bloom stage; 1% oats-plow, good cover, oats 20" high in bloom stage; 34% Bermuda and native grass and weed pasture, grass and weeds 10" high, good cover; 1% in farmstead and gravel roads; cultivated land terraced, contour tilled. |                   |                 | Weighted                         | Average           | 1.76          | 3:11          | 1.02         | .111          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:14          | 1.30         | .1610         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:16          | 1.46         | .2004         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:18          | 1.61         | .2593         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:20          | 1.75         | .3161         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:22          | 1.81         | .3763         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:25          | 1.77         | .4674         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:34          | 1.44         | .7157         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:36          | 1.35         | .7630         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:42          | 1.03         | .8840         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:43          | .967         | .9009         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:45          | .860         | .9319         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:48          | .702         | .9716         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 3:55          | .547         | 1.0451        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 4:15          | .298         | 1.0416        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 4:17          | .197         | 1.3053        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 4:51          | .183         | 1.3179        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 4:54          | .160         | 1.3266        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 4:59          | .143         | 1.3394        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 5:07          | .108         | 1.4858        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 8:30          | .0500        | 1.6659        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 12:00m        | .0224        | 1.7876        |
| Event of June 4, 5, 1957                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |                                  |                   |               |               |              |               |
| 5-4, 7-57                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                 | 0.0411          | 6-4-57                           | Raingage          | 84A           | 6-4-57        |              |               |
| 5-8                                                                                                                                                                                                                                                                                                                                                                                                                             | .03               | .0026           | 3:52p                            | 0                 | 0             | 3:53p         | 0.0008       | 0             |
| 5-9                                                                                                                                                                                                                                                                                                                                                                                                                             | .97               | .2373           | 3:56                             | 2.10              | .14           | 4:00          | .0017        | .0001         |
| 5-10                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                 | .0116           | 3:58                             | 3.00              | .24           | 4:03          | .0036        | .0002         |
| 5-11                                                                                                                                                                                                                                                                                                                                                                                                                            | 3.72              | 2.5000          | 4:00                             | 1.80              | .30           | 4:07          | .0092        | .0007         |
| 5-12                                                                                                                                                                                                                                                                                                                                                                                                                            |                   | .3267           | 4:02                             | 3.00              | .40           | 4:10          | .0275        | .0015         |
| 5-13                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.64              | 1.3000          | 4:06                             | 6.00              | .86           | 4:11          | .0449        | .0021         |
| 5-14, 15                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                 | .0253           | 4:08                             | 3.00              | .90           | 4:13          | .119         | .0047         |
| 5-16                                                                                                                                                                                                                                                                                                                                                                                                                            | .04               | .0044           | 4:14                             | 3.90              | 1.29          | 4:15          | .273         | .0114         |
| 5-17                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                 | .0030           | 4:18                             | 3.00              | 1.49          | 4:18          | .481         | .0310         |
| 5-18                                                                                                                                                                                                                                                                                                                                                                                                                            | .03               | .0030           | 4:20                             | 6.30              | 1.70          | 4:20          | .620         | .0498         |
| 5-19, 22                                                                                                                                                                                                                                                                                                                                                                                                                        |                   | .0071           | 4:24                             | 2.85              | 1.89          | 4:22          | .977         | .0749         |
| 5-23                                                                                                                                                                                                                                                                                                                                                                                                                            | .13               | .0014           | 4:30                             | 1.60              | 2.05          | 4:23          | 1.07         | .0922         |
| 5-24                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                 | .0015           | 4:50                             | .57               | 2.08          | 4:24          | 1.16         | .1111         |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                                                            | .02               | .0005           | Raingage                         | 69                | 1.55          | 4:27          | 1.36         | .1754         |
| 5-26                                                                                                                                                                                                                                                                                                                                                                                                                            | .10               | .0010           | Raingage                         | 70                | 1.67          | 4:29          | 1.42         | .2224         |
| 5-27, 31                                                                                                                                                                                                                                                                                                                                                                                                                        |                   | .0008           | Raingage                         | 75A               | 2.02          | 4:30          | 1.43         | .2465         |
| 6-1                                                                                                                                                                                                                                                                                                                                                                                                                             | .98               | .0048           | Raingage                         | 89                | 1.66          | 4:32          | 1.42         | .2946         |
| 6-2                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                 | .0027           | Raingage                         | W-2A              | 1.13          | 4:36          | 1.28         | .3865         |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                                                             | .41               | .0055           | Weighted                         | Average           | 1.85          | 4:44          | 1.03         | .5420         |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                                                             | .24 3/            | .0049 4/        |                                  |                   |               | 4:47          | .904         | .5916         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 5:52          | .629         | .6542         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 5:56          | .500         | .6931         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                  |                   |               | 5:02          | .373         | .7366         |
| Notes: To convert runoff in in/hr to cfs, multiply by 311.57. 1/ Prior to event beginning 2:33p. 2/ Thiessen method.<br>3/ Rainfall ended 10:56a. 4/ Runoff prior to 3:53p.                                                                                                                                                                                                                                                     |                   |                 |                                  |                   |               |               |              |               |



| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |               |                       |               | Riesel (Waco), Texas Watershed Y |              |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-----------------------|---------------|----------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                 | Rainfall      |                       |               | Runoff                           |              |               |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                    | Rate (in/hr) | Acc. (inches) |
| Event of June 4, 5, 1957 - Continued                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                 |               |                       |               |                                  |              |               |
| Watershed Conditions: 7% in corn, cultivated mid-May; 23% cotton planted last week of May; 11% row grain sorghum 24" high, cultivated mid-May; 4% row sudan 24" high; 1% oats, harvested; 19% oats-clover, oats harvested, clover 12" high; 34% Bermuda and native grass and weed pasture 12" high; 1% farmstead and gravel roads; cropland terraced, contour tilled.                                                                                                  |                   |                 |               |                       |               | 6-4-57                           |              |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 5:10p                            | 0.304        | 0.7825        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | :23                              | .225         | .8401         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | :40                              | .146         | .8928         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | :47                              | .127         | .9090         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 6:04                             | .0863        | .9393         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | :24                              | .0575        | .9632         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 7:45                             | .0198        | 1.0088        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 10:25                            | .0062        | 1.0383        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 12:00m                           | .0038        | 1.0461        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 6-5-57                           |              |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 5:20a                            | .0016        | 1.0595        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 10:05                            | .0009        | 1.0656        |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                       |               |                                  |              |               |
| 5-23-59                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.18              | 0.0878          | 6-23-59       | Raingage              | 84A           | 6-23-59                          |              |               |
| 5-24                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .04               | .0049           | 8:46p         | 0                     | 0             | 8:55p                            | T            | 0             |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .03               | .0016           | :53           | 3.34                  | .39           | 9:18                             | .0004        | .0002         |
| 5-26, 6-1                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                 | .0027           | :57           | 1.50                  | .49           | :30                              | .0007        | .0003         |
| 6-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .19               | .0005           | 9:00          | 2.00                  | .59           | :46                              | .0017        | .0006         |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .02               | .0005           | :04           | 3.00                  | .79           | :58                              | .0044        | .0012         |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.44              | .0909           | :07           | 1.60                  | .87           | 10:05                            | .0133        | .0022         |
| 6-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .63               | .0834           | :43           | .01                   | .88           | :17                              | .0231        | .0059         |
| 6-6, 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                 | .0146           | :47           | 3.00                  | 1.08          | :19                              | .0357        | .0068         |
| 6-12                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .18               | .0009           | :50           | 2.00                  | 1.18          | :21                              | .0537        | .0083         |
| 6-13, 16                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                 | .0004           | :56           | 3.00                  | 1.48          | :23                              | .100         | .0108         |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .72               | .0009           | :59           | 4.20                  | 1.69          | :26                              | .203         | .0187         |
| 6-21                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0                 | .0001           | 10:04         | .96                   | 1.77          | :29                              | .239         | .0300         |
| 6-22, /                                                                                                                                                                                                                                                                                                                                                                                                                                                                | .36               | .0010           | :09           | 1.20                  | 1.87          | :33                              | .278         | .0475         |
| 6-23                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0                 | .0002           | :13           | .60                   | 1.91          | :35                              | .319         | .0576         |
| Watershed Conditions: 9% in corn in dough stage; 25% in cotton on contour, good stand 16" high, beginning to bloom, last cultivation in mid-June; 11% in row grain sorghum, 5' high, grain in dough stage, last cultivation mid-May; 1% oats harvested; 14% in oats-clover, oats harvested, clover 12" high; 35% Bermuda and native grass pasture, grass 10" high, good cover; 4% in sudan, 5' high; 1% farmstead and gravel roads; cropland terraced, contour tilled. |                   |                 | :20           | 3.09                  | 2.27          | :37                              | .364         | .0692         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | :23           | 2.00                  | 2.37          | :39                              | .462         | .0831         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | :27           | 2.85                  | 2.56          | :41                              | .515         | .0997         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | :30           | 2.00                  | 2.66          | :47                              | .575         | .1552         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | :42           | 1.15                  | 2.89          | :50                              | .629         | .1858         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | Raingage      | 69                    | 3.00          | :57                              | .651         | .2624         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | Raingage      | 70                    | 2.87          | :59                              | .661         | .2846         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | Raingage      | 75A                   | 2.79          | 11:03                            | .613         | .3277         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | Raingage      | 89                    | 2.82          | :07                              | .556         | .3673         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | Raingage      | W-2A                  | 2.83          | :12                              | .500         | .4119         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | Raingage      | 69B                   | 2.87          | :16                              | .449         | .4440         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | Weighted      | Average <sup>2/</sup> | 2.86          | :24                              | .357         | .4977         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | :34                              | .273         | .5510         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | :43                              | .199         | .5884         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | :53                              | .168         | .6193         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 12:00m                           | .143         | .6378         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 6-24-59                          |              |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 12:09a                           | .116         | .6577         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | :18                              | .0952        | .6738         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | :29                              | .0781        | .6999         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 1:23                             | .0348        | .7371         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 2:31                             | .0173        | .7660         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 4:19                             | .0065        | .7858         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 7:16                             | .0023        | .7970         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               | 10:29                            | .0010        | .8021         |
| Notes: To convert runoff in in/hr to cfs, multiply by 311.57. 1/ Runoff prior to 8:55p 2/ Thiessen method.                                                                                                                                                                                                                                                                                                                                                             |                   |                 |               |                       |               |                                  |              |               |



RIESEL (WACO), TEXAS Watershed Y



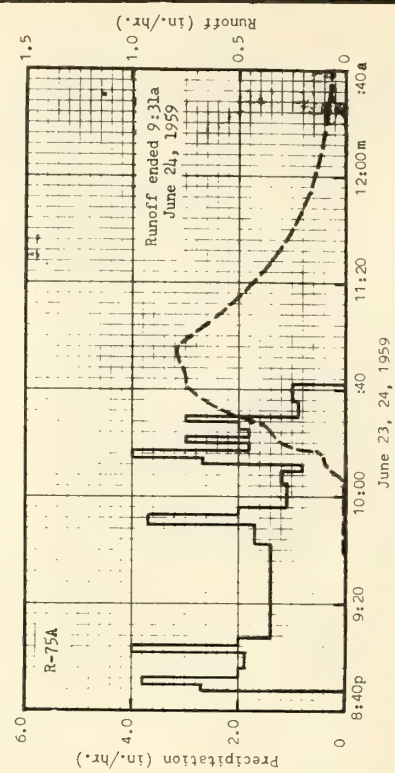
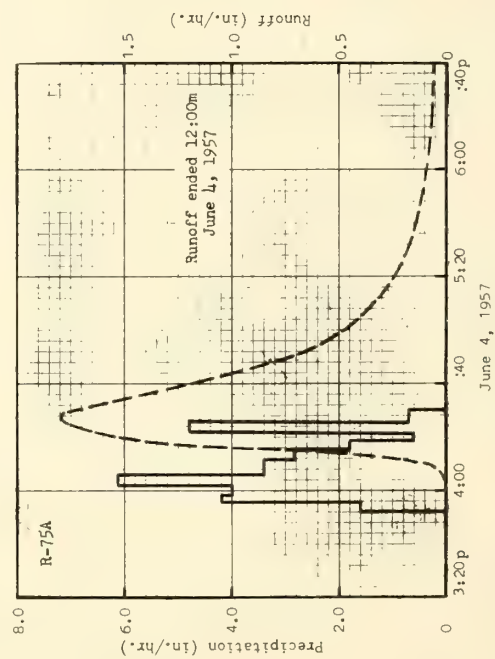
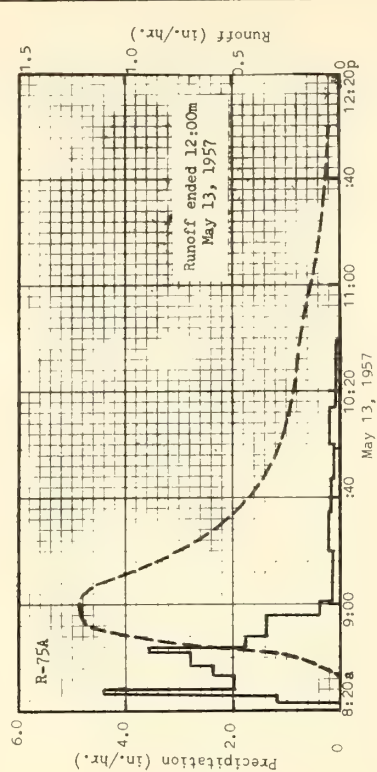
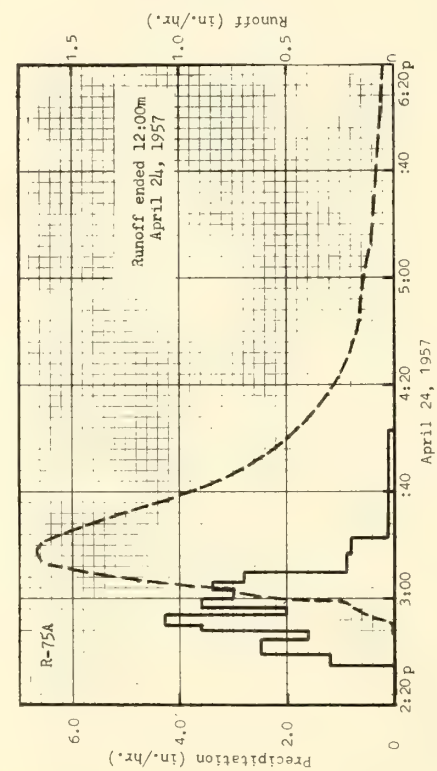


| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |                       |               |              | Riesel (Waco), Texas Watershed Y-2<br>(Area - 132 acres) |          |       |       |      |        |       |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|-----------------------|---------------|--------------|----------------------------------------------------------|----------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                        |                   | Jan.            | Feb.                                      | Mar.              | Apr.                  | May           | June         | July                                                     | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1956                                                                                                                                                                                                                                                                                                                                                 | P                 | 2.21            | 2.38                                      | 0.37              | 0.62                  | 4.49          | 1.94         | 1.88                                                     | 2.55     | 0     | 0.41  | 4.50 | 1.99   | 23.34 |        |      |
|                                                                                                                                                                                                                                                                                                                                                      | Q                 |                 |                                           |                   |                       |               |              | 0                                                        | .02      | 0     | 0     | .11  | 0      | .13   |        |      |
|                                                                                                                                                                                                                                                                                                                                                      | P                 | 1.54            | 3.17                                      | 5.54              | 14.98                 | 8.41          | 4.78         | .01                                                      | 1.17     | 4.13  | 8.31  | 4.64 | .86    | 57.54 |        |      |
|                                                                                                                                                                                                                                                                                                                                                      | Q                 | 0               | .02                                       | .38               | 10.01                 | 6.00          | 1.30         | 0                                                        | 0        | 0     | 1.71  | 1.11 | .03    | 20.56 |        |      |
| 1958                                                                                                                                                                                                                                                                                                                                                 | P                 | 1.78            | 3.44                                      | 1.39              | 3.27                  | 1.91          | 2.44         | .99                                                      | 6.44     | 5.05  | 3.11  | 1.36 | 1.39   | 32.46 |        |      |
|                                                                                                                                                                                                                                                                                                                                                      | Q                 | .08             | 1.07                                      | .08               | .01                   | .54           | 0            | 0                                                        | .01      | .17   | .13   | 0    | 1      | 2.09  |        |      |
| 1959                                                                                                                                                                                                                                                                                                                                                 | P                 | .37             | 3.31                                      | .95               | 3.99                  | 3.95          | 7.18         | 4.39                                                     | 3.18     | 1.88  | 6.83  | 2.01 | 3.55   | 41.59 |        |      |
|                                                                                                                                                                                                                                                                                                                                                      | Q                 | 0               | .42                                       | .01               | .30                   | .09           | 1.24         | .01                                                      | 0        | 0     | 1.13  | .59  | .69    | 4.48  |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                              |                   |                 |                                           |                   |                       |               |              | Riesel (Waco), Texas Watershed Y-2                       |          |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                 | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |                       |               |              |                                                          |          |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 | 1 hour                                    |                   | 2 hours               |               | 6 hours      |                                                          | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                      | Date              | Rate            | Date                                      | Vol.              | Date                  | Vol.          | Date         | Vol.                                                     | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                                                                                                                                                                                                                 | 4-19              | 2.58            | 4-19                                      | 2.20              | 4-19                  | 2.81          | 4-23         | 3.18                                                     | 4-23     | 3.32  | 4-23  | 3.33 | 4-23   | 4.95  | 4-19   | 9.20 |
| 1958                                                                                                                                                                                                                                                                                                                                                 | 5-3               | .13             | 5-3                                       | .12               | 5-3                   | .21           | 2-22         | .38                                                      | 2-22     | .57   | 2-22  | .91  | 2-22   | 1.01  | 2-21   | 1.03 |
| 1959                                                                                                                                                                                                                                                                                                                                                 | 6-23              | .86             | 6-23                                      | .63               | 6-23                  | .97           | 6-23         | 1.03                                                     | 6-23     | 1.07  | 6-23  | 1.07 | 6-23   | 1.12  | 6-23   | 1.12 |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volumes, excellent. Watershed conditions: No appreciable change in land use or conservation practices since 1955. See page 42.12-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, SWC, June 1957 (reprinted 1961). |                   |                 |                                           |                   |                       |               |              |                                                          |          |       |       |      |        |       |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                               |                   |                 |                                           |                   |                       |               |              | Riesel (Waco), Texas Watershed Y-2                       |          |       |       |      |        |       |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                |                   |                 |                                           | Rainfall          |                       |               |              | Runoff                                                   |          |       |       |      |        |       |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                 | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches)         | Date and time | Rate (in/hr) | Acc. (inches)                                            |          |       |       |      |        |       |        |      |
| Event of April 24, 1957                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |                       |               |              |                                                          |          |       |       |      |        |       |        |      |
| 3-27-57                                                                                                                                                                                                                                                                                                                                              | 1.02              | 0.0180          | 4-24-57                                   | Raingage          | .75A                  | 4-24-57       |              |                                                          |          |       |       |      |        |       |        |      |
| 3-28                                                                                                                                                                                                                                                                                                                                                 | 0                 | .0026           | 2:35p                                     | 0                 | 0                     | 2:40p         | 0.0004       | 0                                                        |          |       |       |      |        |       |        |      |
| 3-31                                                                                                                                                                                                                                                                                                                                                 | 1.30              | .2176           | :39                                       | 1.20              | .04                   | :50           | .0025        | .0001                                                    |          |       |       |      |        |       |        |      |
| 4-1, 2                                                                                                                                                                                                                                                                                                                                               |                   | .0227           | :45                                       | 2.50              | .29                   | :51           | .0048        | .0002                                                    |          |       |       |      |        |       |        |      |
| 4-3                                                                                                                                                                                                                                                                                                                                                  | .25               | .0002           | :48                                       | 1.60              | .37                   | :52           | .0316        | .0005                                                    |          |       |       |      |        |       |        |      |
| 4-4                                                                                                                                                                                                                                                                                                                                                  | .02               | 0               | :50                                       | 3.60              | .49                   | :53           | .0857        | .0015                                                    |          |       |       |      |        |       |        |      |
| 4-8                                                                                                                                                                                                                                                                                                                                                  | .03               | 0               | :54                                       | 4.35              | .78                   | :55           | .164         | .0058                                                    |          |       |       |      |        |       |        |      |
| 4-13                                                                                                                                                                                                                                                                                                                                                 | .05               |                 | :57                                       | 2.00              | .88                   | :59           | .391         | .0206                                                    |          |       |       |      |        |       |        |      |
| 4-15                                                                                                                                                                                                                                                                                                                                                 | .04               |                 | 3:00                                      | 3.60              | 1.06                  | 3:00          | .545         | .0284                                                    |          |       |       |      |        |       |        |      |
| 4-19                                                                                                                                                                                                                                                                                                                                                 | 5.21              | 2.8853          | :03                                       | 3.00              | 1.21                  | :01           | .642         | .0383                                                    |          |       |       |      |        |       |        |      |
| 4-20                                                                                                                                                                                                                                                                                                                                                 | .29               | .3554           | :06                                       | 3.40              | 1.38                  | :03           | .789         | .0622                                                    |          |       |       |      |        |       |        |      |
| 4-21                                                                                                                                                                                                                                                                                                                                                 | .20               | .0040           | :10                                       | 2.85              | 1.57                  | :04           | .887         | .0762                                                    |          |       |       |      |        |       |        |      |
| 4-22                                                                                                                                                                                                                                                                                                                                                 | .33               | .0327           | :17                                       | .94               | 1.68                  | :05           | .992         | .0918                                                    |          |       |       |      |        |       |        |      |
| 4-23                                                                                                                                                                                                                                                                                                                                                 | 3.84              | 3.3278          | :23                                       | .80               | 1.76                  | :07           | 1.25         | .1265                                                    |          |       |       |      |        |       |        |      |
| 4-24                                                                                                                                                                                                                                                                                                                                                 | .03               | .0055           | 4:03                                      | .12               | 1.84                  | :09           | 1.40         | .1738                                                    |          |       |       |      |        |       |        |      |
| Watershed Conditions: 19% of area bedded for cotton, no crop; 21% row grain sorghum planted mid-April, 2" high; 10% row sudan planted mid-April, 1" high; 18% of fall seeded oats-clover, oats 20" high in bloom stage; 31% Bermuda grass pasture, grass and weeds 10" high, good cover; 1% gravel roads; cropland terraced, contour tilled.         |                   |                 |                                           | Raingage          | .69                   | 1.79          | :11          | 1.53                                                     | .2227    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           | Raingage          | .70                   | 1.75          | :13          | 1.62                                                     | .2751    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           | Raingage          | .84A                  | 1.54          | :15          | 1.67                                                     | .3298    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           | Weighted          | Average <sup>2/</sup> | 1.79          | :17          | 1.68                                                     | .3855    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :20          | 1.67                                                     | .4691    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :22          | 1.63                                                     | .5241    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :26          | 1.50                                                     | .6286    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :30          | 1.34                                                     | .7237    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :34          | 1.19                                                     | .8082    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :38          | 1.04                                                     | .8825    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :42          | .902                                                     | .9472    |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :46          | .781                                                     | 1.0033   |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :53          | .618                                                     | 1.0841   |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | 4:00         | .492                                                     | 1.1482   |       |       |      |        |       |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |                       |               | :10          | .370                                                     | 1.2193   |       |       |      |        |       |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 133.68. <sup>1/</sup> Prior to event beginning 2:35p. <sup>2/</sup> Thiessen method. For map of watershed, see page 42.11-5.                                                                                                                                                                   |                   |                 |                                           |                   |                       |               |              |                                                          |          |       |       |      |        |       |        |      |



| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                    |                   |                 |               |                       |               | Riesel (Waco), Texas Watershed Y-2 |              |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-----------------------|---------------|------------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                     |                   |                 | Rainfall      |                       |               | Runoff                             |              |               |
| Date                                                                                                                                                                                                                                                                                                      | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                      | Rate (in/hr) | Acc. (inches) |
| Event of April 24, 1957 - Continued                                                                                                                                                                                                                                                                       |                   |                 |               |                       |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 4-24-57                            |              |               |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 4:19p                              | 0.305        | 1.2691        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | :24                                | .268         | 1.2930        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | :36                                | .205         | 1.3400        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | :45                                | .168         | 1.3679        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | :55                                | .142         | 1.3934        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 5:13                               | .114         | 1.4314        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 6:20                               | .0534        | 1.5250        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 7:00                               | .0304        | 1.5524        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 8:17                               | .0146        | 1.5799        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 9:20                               | .0092        | 1.5924        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 12:00m                             | .0034        | 1.6076        |
| Event of May 13, 1957                                                                                                                                                                                                                                                                                     |                   |                 |               |                       |               |                                    |              |               |
| 4-13-57                                                                                                                                                                                                                                                                                                   | 0.05              | 0               | 5-13-57       | Raingage              | 75A           | 5-13-57                            |              |               |
| 4-15                                                                                                                                                                                                                                                                                                      | .04               | 0               | 8:23a         | 0                     | 0             | 8:20a                              | 0.0002       | 0             |
| 4-19                                                                                                                                                                                                                                                                                                      | 5.21              | 2.8853          | :26           | 1.20                  | .06           | :30                                | .0014        | .0001         |
| 4-20                                                                                                                                                                                                                                                                                                      | .29               | .3554           | :28           | 4.50                  | .21           | :35                                | .0493        | .0010         |
| 4-21                                                                                                                                                                                                                                                                                                      | .20               | .0040           | :33           | 2.04                  | .38           | :37                                | .118         | .0038         |
| 4-22                                                                                                                                                                                                                                                                                                      | .33               | .0327           | :37           | 2.40                  | .54           | :41                                | .216         | .0144         |
| 4-23                                                                                                                                                                                                                                                                                                      | 3.84              | 3.3278          | :42           | 2.88                  | .78           | :43                                | .492         | .0254         |
| 4-24                                                                                                                                                                                                                                                                                                      | 1.83              | 1.6131          | :44           | 3.60                  | .90           | :44                                | .626         | .0347         |
| 4-25                                                                                                                                                                                                                                                                                                      | 0                 | .0173           | :48           | 1.80                  | 1.02          | :46                                | .819         | .0589         |
| 4-26                                                                                                                                                                                                                                                                                                      | 1.25              | .5649           | :56           | 1.42                  | 1.21          | :48                                | .961         | .0886         |
| 4-27                                                                                                                                                                                                                                                                                                      | .27               | .4047           | 9:01          | .48                   | 1.25          | :50                                | 1.08         | .1227         |
| 4-28                                                                                                                                                                                                                                                                                                      | 1.30              | .6943           | :20           | .19                   | 1.31          | :52                                | 1.19         | .1606         |
| 4-29                                                                                                                                                                                                                                                                                                      | .03               | .0806           | :35           | .24                   | 1.37          | :55                                | 1.23         | .2212         |
| 4-30                                                                                                                                                                                                                                                                                                      | .03               | .0042           | :47           | .20                   | 1.41          | 9:00                               | 1.24         | .3245         |
| 5-1                                                                                                                                                                                                                                                                                                       | .23               | .0176           | 10:00         | .18                   | 1.45          | :04                                | 1.21         | .4061         |
| 5-2                                                                                                                                                                                                                                                                                                       | 0                 | .0047           | :14           | .21                   | 1.50          | :08                                | 1.13         | .4840         |
| 5-3                                                                                                                                                                                                                                                                                                       | 1.57              | 1.2044          | :39           | .14                   | 1.56          | :12                                | 1.01         | .5551         |
| 5-4, 7                                                                                                                                                                                                                                                                                                    | 0                 | .0148           | Raingage      | 69                    | 1.54          | :16                                | .887         | .6182         |
| 5-8                                                                                                                                                                                                                                                                                                       | .03               | .0003           | Raingage      | 70                    | 1.50          | :22                                | .736         | .6997         |
| 5-9                                                                                                                                                                                                                                                                                                       | .98               | .2567           | Raingage      | 84A                   | 1.64          | :28                                | .609         | .7667         |
| 5-10                                                                                                                                                                                                                                                                                                      | 0                 | .0053           | Weighted      | Average <sup>2/</sup> | 1.57          | :34                                | .507         | .8223         |
| 5-11                                                                                                                                                                                                                                                                                                      | 3.68              | 2.9195          |               |                       |               | :40                                | .426         | .8687         |
| 5-12                                                                                                                                                                                                                                                                                                      | 0                 | .1727           |               |                       |               | :49                                | .350         | .9268         |
| 5-13                                                                                                                                                                                                                                                                                                      | .04               | .0018           |               |                       |               | 10:10                              | .262         | 1.0331        |
| Watershed Conditions: 19% of area bedded for cotton, no crop; 21% row grain sorghum 8" high; 10% row sudan, 10" high; 18% oats-clover, oats 40" high in dough stage, clover growing; 31% Bermuda grass pasture, grass and weeds 12" high, good cover; 1% gravel roads; cropland terraced, contour tilled. |                   |                 |               |                       |               | :25                                | .228         | 1.0943        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | :40                                | .195         | 1.1471        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 11:00                              | .144         | 1.2034        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | :45                                | .0721        | 1.2787        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 12:15p                             | .0437        | 1.3077        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 1:25                               | .0179        | 1.3398        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 2:28                               | .0098        | 1.3540        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 3:45                               | .0052        | 1.3611        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 5:50                               | .0022        | 1.3703        |
|                                                                                                                                                                                                                                                                                                           |                   |                 |               |                       |               | 12:00m                             | .0007        | 1.3778        |
| Event of June 4, 1957                                                                                                                                                                                                                                                                                     |                   |                 |               |                       |               |                                    |              |               |
| 5-4, 7-57                                                                                                                                                                                                                                                                                                 | 0                 | 0.0148          | 6-4-57        | Raingage              | 75A           | 6-4-57                             |              |               |
| 5-8                                                                                                                                                                                                                                                                                                       | .03               | .0003           | 3:52p         | 0                     | 0             | 3:54p                              | 0.0010       | 0             |
| 5-9                                                                                                                                                                                                                                                                                                       | .98               | .2567           | :55           | 1.60                  | .08           | 4:00                               | .0037        | .0002         |
| 5-10                                                                                                                                                                                                                                                                                                      | 0                 | .0053           | :58           | 4.20                  | .29           | :02                                | .0070        | .0003         |
| 5-11                                                                                                                                                                                                                                                                                                      | 3.68              | 2.9195          | 4:01          | 4.05                  | .56           | :04                                | .0123        | .0007         |
| 5-12                                                                                                                                                                                                                                                                                                      | 0                 | .1727           | :05           | 6.15                  | .97           | :06                                | .0187        | .0012         |
| 5-13                                                                                                                                                                                                                                                                                                      | 1.62              | 1.3796          | :11           | 3.40                  | 1.31          | :08                                | .0316        | .0020         |
| 5-14, 15                                                                                                                                                                                                                                                                                                  | 0                 | .0121           | :15           | 2.85                  | 1.50          | :12                                | .244         | .0098         |
| 5-16                                                                                                                                                                                                                                                                                                      | .04               | .0013           | :18           | 1.80                  | 1.59          | :14                                | .618         | .0241         |
| 5-17                                                                                                                                                                                                                                                                                                      | 0                 | .0012           | :21           | .60                   | 1.62          | :16                                | 1.04         | .0516         |
| 5-18                                                                                                                                                                                                                                                                                                      | .03               | .0018           | :25           | 4.80                  | 1.94          | :18                                | 1.34         | .0917         |
| 5-19, 22                                                                                                                                                                                                                                                                                                  | 0                 | .0031           | :30           | .72                   | 2.00          | :20                                | 1.52         | .1394         |
| 5-23                                                                                                                                                                                                                                                                                                      | .12               | .0007           | Raingage      | 69                    | 1.71          | :24                                | 1.71         | .2478         |
| Notes: To convert runoff in in/hr to cfs, multiply by 133.06. <sup>1/</sup> Prior to event beginning 8:23a. <sup>2/</sup> Thiessen method.                                                                                                                                                                |                   |                 |               |                       |               |                                    |              |               |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                     |                   |                     | Riesel (Waco), Texas |                       |               | Watershed Y-2 |              |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------|----------------------|-----------------------|---------------|---------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                      |                   |                     | Rainfall             |                       |               | Runoff        |              |               |
| Date                                                                                                                                                                                                                                                                                                                       | Rainfall (inches) | Runoff (inches)     | Date and time        | Intensity (in/hr)     | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches) |
| Event of June 4, 1957 - Continued                                                                                                                                                                                                                                                                                          |                   |                     |                      |                       |               |               |              |               |
| 5-24-57                                                                                                                                                                                                                                                                                                                    | 0                 | 0.0006              | 6-4-57               |                       |               | 6-4-57        |              |               |
| 5-25                                                                                                                                                                                                                                                                                                                       | .01               | .0002               | Raingage             | 70                    | 1.67          | 4:25p         | 1.76         | 0.2767        |
| 5-26                                                                                                                                                                                                                                                                                                                       | .09               | .0005               | Raingage             | 84A                   | 2.05          | :26           | 1.79         | .3063         |
| 5-27, 28                                                                                                                                                                                                                                                                                                                   |                   | .0003               | Weighted             | Average <sup>3</sup>  | 1.88          | :28           | 1.79         | .3659         |
| 6-1                                                                                                                                                                                                                                                                                                                        | .91               | .0038               |                      |                       |               | :30           | 1.73         | .4245         |
| 6-2                                                                                                                                                                                                                                                                                                                        | 0                 | .0015               |                      |                       |               | :34           | 1.53         | .5333         |
| 6-3                                                                                                                                                                                                                                                                                                                        | .39               | .0038               |                      |                       |               | :36           | 1.40         | .5820         |
| 6-4                                                                                                                                                                                                                                                                                                                        | .24 <sup>1/</sup> | .0054 <sup>2/</sup> |                      |                       |               | :38           | 1.29         | .6269         |
| Watershed Conditions: 10% cotton planted last week of May; 21% row grain sorghum 24" high cultivated mid-May; 10% row sudan, 24" high, good stand; 18% oats-clover, oats harvested, clover growing 12" high; 31% Bermuda grass and weed pasture, 12" high, good cover; 1% gravel roads; cropland terraced, contour tilled. |                   |                     |                      |                       |               |               |              |               |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :40           | 1.18         | .6680         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :44           | .977         | .7397         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :48           | .804         | .7984         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :52           | .667         | .8475         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :56           | .561         | .8883         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 5:00          | .470         | .9226         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :4            | .398         | .9615         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :14           | .286         | 1.0078        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :40           | .14          | 1.0940        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 6:04          | .0992        | 1.1407        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :25           | .0696        | 1.1706        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 7:10          | .0316        | 1.2064        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :55           | .0196        | 1.2249        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 9:10          | .0104        | 1.2432        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 10:50         | .0056        | 1.2557        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 12:00m        | .0040        | 1.2614        |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                                                                                 |                   |                     |                      |                       |               |               |              |               |
| 5-23-59                                                                                                                                                                                                                                                                                                                    | 0.20              | 0.0474              | 6-23-59              | Raingage              | 75A           | 6-23-59       |              |               |
| 5-24                                                                                                                                                                                                                                                                                                                       | .04               | .0009               | 8:47p                | 0                     | 0             | :32p          | 0            | 0             |
| 5-25                                                                                                                                                                                                                                                                                                                       | .01               | .0001               | :49                  | 2.70                  | .09           | :39           | .0131        | .0011         |
| 6-2                                                                                                                                                                                                                                                                                                                        | .18               | 0                   | :52                  | 3.80                  | .28           | :51           | .11          | .0035         |
| 6-3                                                                                                                                                                                                                                                                                                                        | .02               | 0                   | :55                  | 2.00                  | .38           | :59           | .0131        | .0051         |
| 6-4                                                                                                                                                                                                                                                                                                                        | 1.45              | .0547               | 9:01                 | 1.90                  | .57           | 10:07         | .0257        | .0072         |
| 6-5                                                                                                                                                                                                                                                                                                                        | .43               | .0675               | :04                  | 4.00                  | .77           | :09           | .0578        | .0085         |
| 6-6                                                                                                                                                                                                                                                                                                                        | 0                 | .0040               | :07                  | 2.00                  | .87           | :10           | .0857        | .0097         |
| 6-12                                                                                                                                                                                                                                                                                                                       | .17               | 0                   | :42                  | 1.40                  | .89           | :16           | .122         | .0204         |
| 6-20                                                                                                                                                                                                                                                                                                                       | .72               |                     | :49                  | 1.72                  | 1.09          | :18           | .244         | .0264         |
| 6-22                                                                                                                                                                                                                                                                                                                       | .36               |                     | :53                  | 3.75                  | 1.34          | :20           | .318         | .0357         |
| 6-23                                                                                                                                                                                                                                                                                                                       | .44 <sup>1/</sup> | 0                   | :57                  | 2.00                  | 1.44          | :25           | .357         | .0638         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | 10:05                | 1.14                  | 1.61          | :28           | .426         | .0832         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :09                  | 1.20                  | 1.69          | :31           | .492         | .0986         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :12                  | .80                   | 1.73          | :33           | .461         | .1263         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :14                  | 2.70                  | 1.82          | :36           | .667         | .1580         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :17                  | 4.00                  | 2.02          | :42           | .751         | .2294         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :21                  | 1.80                  | 2.11          | :48           | .774         | .3053         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :22                  | 3.00                  | 2.21          | :54           | .796         | .3838         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :25                  | 1.80                  | 2.30          | :59           | .796         | .4104         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :28                  | 2.00                  | 2.40          | 11:01         | .736         | .4742         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :30                  | 3.00                  | 2.50          | :05           | .667         | .5209         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :36                  | .50                   | 2.59          | :13           | .538         | .6012         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | :42                  | 1.20                  | 2.69          | :19           | .500         | .6271         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | Raingage             | 79                    | 2.90          | :20           | .447         | .6587         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | Raingage             | 69B                   | 2.95          | :30           | .337         | .7239         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | Raingage             | 70                    | 2.87          | :40           | .262         | .7738         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | Raingage             | 84A                   | 2.79          | 12:00m        | .168         | .8441         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     | Weighted             | Average <sup>3/</sup> | 2.83          | 6-24-59       |              |               |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 12:27a        | .118         | .9072         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 1:16          | .0672        | .9813         |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :56           | .0370        | 1.0159        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 2:50          | .0187        | 1.0401        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :51           | .0092        | 1.0536        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | :58           | .0048        | 1.0611        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 7:12          | .0016        | 1.0674        |
|                                                                                                                                                                                                                                                                                                                            |                   |                     |                      |                       |               | 9:31          | .0006        | 1.0697        |
| Notes: To convert runoff in in/hr to cfs, multiply by 133.66. <sup>1/</sup> Prior rainfall ended 11:30a. <sup>2/</sup> Runoff prior to 3:34p. <sup>3/</sup> Thiessen method. <sup>4/</sup> Rainfall prior to 8:47p.                                                                                                        |                   |                     |                      |                       |               |               |              |               |



RIESEL (WACO), TEXAS Watershed Y-2

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas |          | Watershed Y-4<br>(Area - 79.9 acres) |       |      |        |      |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|--------------|----------------------|----------|--------------------------------------|-------|------|--------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                        | Jan.              | Feb.            | Mar.                                      | Apr.              | May           | June          | July         | Aug.                 | Sept.    | Oct.                                 | Nov.  | Dec. | Year   |      |        |      |
| 1957 P                                                                                                                                                                                                                                                                                                                                               | 2.25              | 2.38            | 0.36                                      | 0.60              | 4.54          | 1.94          | 1.78         | 2.54                 | 0        | 0.40                                 | 4.49  | 1.96 | 23.24  |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   | 0               | 0                                         | 0                 | 0             | 0             |              | 0                    |          | 0                                    | .16   | 0    | .16    |      |        |      |
| 1957 P                                                                                                                                                                                                                                                                                                                                               | 1.55              | 3.18            | 5.57                                      | 15.22             | 8.43          | 4.61          | .01          | 1.20                 | 4.16     | 8.42                                 | 4.71  | .85  | 57.91  |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 | .48                                       | 10.34             | 6.35          | 1.37          | 0            | 0                    | 0        | 1.79                                 | 1.24  | .03  | 21.63  |      |        |      |
| 1958 P                                                                                                                                                                                                                                                                                                                                               | 1.79              | 3.48            | 1.40                                      | 3.27              | 1.86          | 2.50          | .98          | 6.53                 | 5.21     | 3.07                                 | 1.36  | 1.40 | 32.85  |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      | .09               | 1.08            | .09                                       | .02               | .66           | 0             | 0            | .03                  | .22      | .19                                  | 0     | T    | 2.38   |      |        |      |
| 1959 P                                                                                                                                                                                                                                                                                                                                               | .38               | 3.32            | .92                                       | 4.01              | 3.96          | 7.22          | 4.45         | 3.29                 | 1.88     | 4.81                                 | 2.04  | 3.58 | 41.86  |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      | T                 | .48             | .01                                       | .35               | .06           | 1.11          | .01          |                      |          | 1.21                                 | .54   | .79  | 4.56   |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                              |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas |          | Watershed Y-4                        |       |      |        |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                 | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |              |                      |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours      |                      | 12 hours |                                      | 1 day |      | 2 days |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                      | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date         | Vol.                 | Date     | Vol.                                 | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1957                                                                                                                                                                                                                                                                                                                                                 | 4-19              | 2.52            | 4-19                                      | 2.16              | 4-19          | 2.85          | 4-23         | 3.25                 | 4-23     | 3.4                                  | 4-23  | 3.43 | 4-23   | 5.12 | 4-19   | 9.46 |
| 1958                                                                                                                                                                                                                                                                                                                                                 | 5-3               | .15             | 5-3                                       | .12               | 5-3           | .22           | 5-3          | .40                  | 5-3      | .56                                  | 2-22  | .86  | 2-22   | 1.00 | 2-21   | 1.07 |
| 1959                                                                                                                                                                                                                                                                                                                                                 | 6-23              | .79             | 6-23                                      | .57               | 6-23          | .79           | 6-23         | .95                  | 6-23     | .97                                  | 10-4  | 1.03 | 10-4   | 1.07 | 10-4   | 1.07 |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volumes, excellent. Watershed conditions: no appreciable change in land use or conservation practices since 1955. See page 42.13-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, 4th, SWC, June 1957 (reprinted 1961). |                   |                 |                                           |                   |               |               |              |                      |          |                                      |       |      |        |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                               |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas |          | Watershed Y-4                        |       |      |        |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                |                   |                 |                                           | Rainfall          |               |               |              | Runoff               |          |                                      |       |      |        |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                 | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches)        |          |                                      |       |      |        |      |        |      |
| Event of April 24, 25, 1957                                                                                                                                                                                                                                                                                                                          |                   |                 |                                           |                   |               |               |              |                      |          |                                      |       |      |        |      |        |      |
| 3-27-57                                                                                                                                                                                                                                                                                                                                              | 1.06              | 0.036           | 4-24-57                                   | Raingage          |               | 4-24-57       |              |                      |          |                                      |       |      |        |      |        |      |
| 3-28, 29                                                                                                                                                                                                                                                                                                                                             | 0                 | .003            | 2:33p                                     | 0                 | 0             | 2:34p         | 0.0009       | 0                    |          |                                      |       |      |        |      |        |      |
| 3-31                                                                                                                                                                                                                                                                                                                                                 | 1.32              | .281            | :36                                       | 1.80              | .09           | :44           | .0020        | T                    |          |                                      |       |      |        |      |        |      |
| 4-1, 2                                                                                                                                                                                                                                                                                                                                               | 0                 | .038            | :39                                       | 2.40              | .21           | :50           | .0050        | T                    |          |                                      |       |      |        |      |        |      |
| 4-3                                                                                                                                                                                                                                                                                                                                                  | .25               | .002            | :44                                       | 2.04              | .38           | :53           | .0108        | .001                 |          |                                      |       |      |        |      |        |      |
| 4-4                                                                                                                                                                                                                                                                                                                                                  | .02               | .017            | :49                                       | 2.40              | .58           | :57           | .0201        | .002                 |          |                                      |       |      |        |      |        |      |
| 4-8                                                                                                                                                                                                                                                                                                                                                  | .03               | 0               | :55                                       | 3.50              | .93           | 3:00          | .0421        | .003                 |          |                                      |       |      |        |      |        |      |
| 4-13                                                                                                                                                                                                                                                                                                                                                 | .05               | 0               | 3:00                                      | 2.64              | 1.15          | :02           | .148         | .006                 |          |                                      |       |      |        |      |        |      |
| 4-15                                                                                                                                                                                                                                                                                                                                                 | .04               | 0               | :03                                       | 3.40              | 1.32          | :03           | .213         | .009                 |          |                                      |       |      |        |      |        |      |
| 4-19                                                                                                                                                                                                                                                                                                                                                 | 5.37              | 2.935           | :08                                       | 2.16              | 1.50          | :04           | .302         | .013                 |          |                                      |       |      |        |      |        |      |
| 4-20                                                                                                                                                                                                                                                                                                                                                 | .30               | .416            | :13                                       | 1.20              | 1.60          | :05           | .415         | .019                 |          |                                      |       |      |        |      |        |      |
| 4-21                                                                                                                                                                                                                                                                                                                                                 | .20               | .015            | :17                                       | 1.65              | 1.71          | :10           | 1.04         | .086                 |          |                                      |       |      |        |      |        |      |
| 4-22                                                                                                                                                                                                                                                                                                                                                 | .33               | .055            | :27                                       | .24               | 1.75          | :13           | 1.24         | .143                 |          |                                      |       |      |        |      |        |      |
| 4-23                                                                                                                                                                                                                                                                                                                                                 | 3.88              | 3.42            | :51                                       | .10               | 1.79          | :15           | 1.39         | .186                 |          |                                      |       |      |        |      |        |      |
| 4-24 1/2                                                                                                                                                                                                                                                                                                                                             | 0                 | .014            | Raingage                                  | 75A               | 1.76          | :18           | 1.54         | .260                 |          |                                      |       |      |        |      |        |      |
| Watershed Conditions: 32% of area bedded for cotton, no crop growing; 7% row grain sorghum, planted mid-April, 2" high; 29% oats-clover, good growth, oats 20" high in bloom stage; 31% Bermuda grass and weed pasture, grass and weeds 10" high, good cover; 1% gravel roads; cropland terraced, contour tilled.                                    |                   |                 |                                           |                   |               |               |              |                      |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 | Raingage                                  | 84A               |               | :22           | 1.61         | .365                 |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 | Weighted                                  | Average 2/        | 1.77          | :26           | 1.56         | .471                 |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :29           | 1.49         | .547                 |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :35           | 1.30         | .686                 |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :40           | 1.14         | .788                 |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :46           | .947         | .892                 |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :54           | .742         | 1.002                |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | 4:01          | .599         | 1.082                |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :12           | .468         | 1.179                |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :22           | .370         | 1.248                |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :36           | .262         | 1.322                |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :53           | .191         | 1.383                |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | 5:10          | .169         | 1.435                |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | :39           | .0870        | 1.493                |          |                                      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               | 7:06          | .0457        | 1.579                |          |                                      |       |      |        |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 86.54. 1/ Runoff prior to 2:34p. 2/ Thiessen method. For map of watershed, see page 42.11-5.                                                                                                                                                                                                   |                   |                 |                                           |                   |               |               |              |                      |          |                                      |       |      |        |      |        |      |

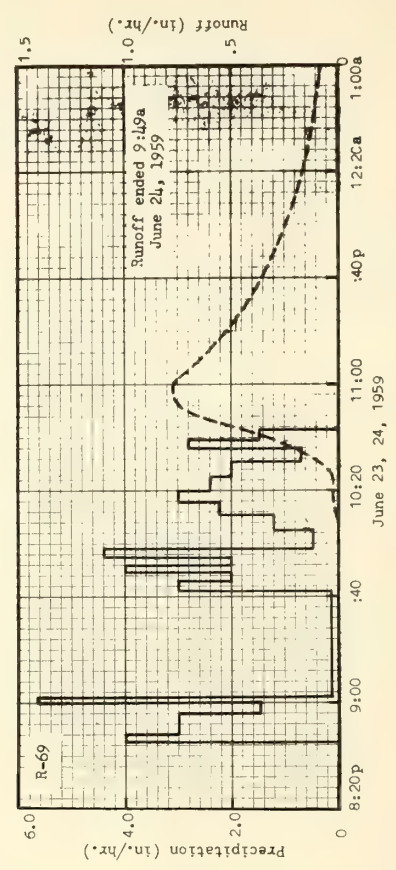
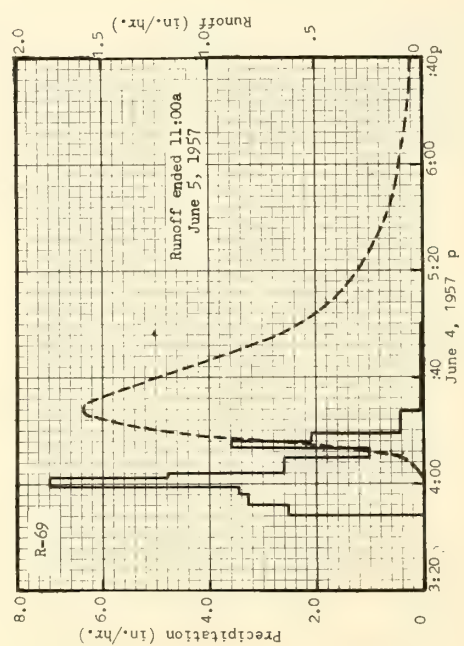
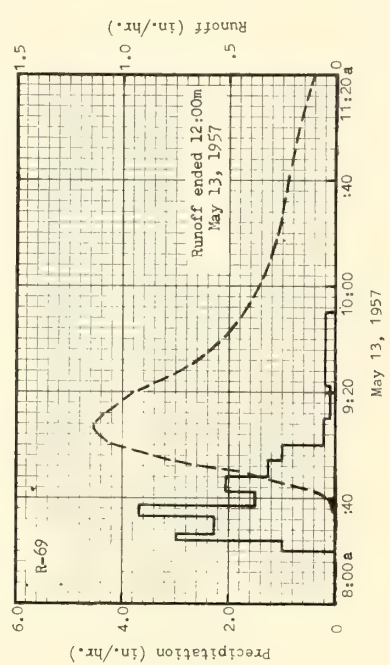
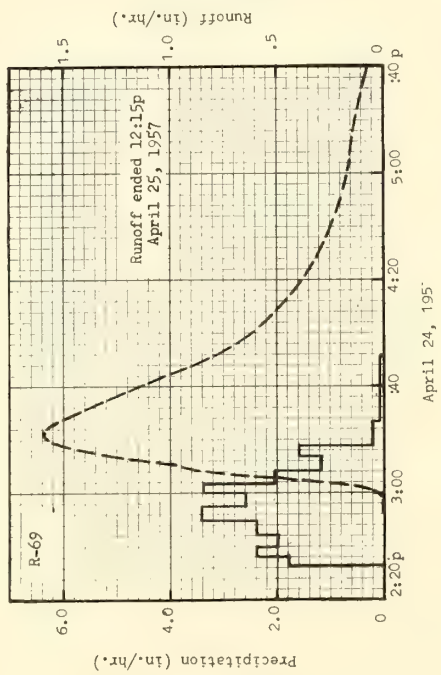
Cooperative Research Project of USDA and Texas Agricultural Experiment Station



| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                           |                   |                    |               |                       |               | Riesel (Waco), Texas Watershed Y-4 |              |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|---------------|-----------------------|---------------|------------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                            |                   |                    | Rainfall      |                       |               | Runoff                             |              |               |
| Date                                                                                                                                                                                                                                                                                             | Rainfall (inches) | Runoff (inches)    | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                      | Rate (in/hr) | Acc. (inches) |
| Event of April 24, 25, 1957 - Continued                                                                                                                                                                                                                                                          |                   |                    |               |                       |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 4-24-57                            |              |               |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 8:41p                              | 0.0213       | 1.629         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 9:57                               | .0125        | 1.649         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 12:00m                             | .0068        | 1.668         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 4-25-57                            |              |               |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 4:15a                              | .0026        | 1.684         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 12:15p                             | .0010        | 1.698         |
| Event of May 13, 1957                                                                                                                                                                                                                                                                            |                   |                    |               |                       |               |                                    |              |               |
| 4-13-57                                                                                                                                                                                                                                                                                          | 0.05              | 0                  | 5-13-57       | Raingage              | 69            | 5-13-57                            |              |               |
| 4-15                                                                                                                                                                                                                                                                                             | .04               | 0                  | 8:20a         | 0                     | 0             | 8:20a                              | 0.0004       | 0             |
| 4-19                                                                                                                                                                                                                                                                                             | 5.37              | 2.935              | :24           | 1.05                  | .07           | :33                                | .0033        | T             |
| 4-20                                                                                                                                                                                                                                                                                             | .30               | .416               | :26           | 3.00                  | .17           | :36                                | .0085        | T             |
| 4-21                                                                                                                                                                                                                                                                                             | .20               | .015               | :33           | 2.32                  | .44           | :40                                | .0482        | .002          |
| 4-22                                                                                                                                                                                                                                                                                             | .33               | .055               | :37           | 3.75                  | .69           | :44                                | .180         | .009          |
| 4-23                                                                                                                                                                                                                                                                                             | 3.88              | 3.425              | :42           | 1.56                  | .82           | :46                                | .302         | .017          |
| 4-24                                                                                                                                                                                                                                                                                             | 1.85              | 1.682              | :48           | 2.10                  | 1.03          | :48                                | .370         | .028          |
| 4-25                                                                                                                                                                                                                                                                                             | 0                 | .036               | :54           | 1.30                  | 1.16          | :50                                | .452         | .042          |
| 4-26                                                                                                                                                                                                                                                                                             | 1.26              | .512               | 9:00          | 1.00                  | 1.26          | :51                                | .626         | .051          |
| 4-27                                                                                                                                                                                                                                                                                             | .26               | .384               | :10           | .24                   | 1.30          | :53                                | .761         | .074          |
| 4-28                                                                                                                                                                                                                                                                                             | 1.32              | .683               | :22           | .15                   | 1.33          | :57                                | .916         | .130          |
| 4-29                                                                                                                                                                                                                                                                                             | .03               | .131               | :50           | .21                   | 1.43          | 9:01                               | 1.06         | .196          |
| 4-30                                                                                                                                                                                                                                                                                             | .04               | .011               | Raingage      | 75A                   | 1.49          | :04                                | 1.11         | .251          |
| 5-1                                                                                                                                                                                                                                                                                              | .23               | .027               | Raingage      | 84A                   | 1.48          | :06                                | 1.14         | .288          |
| 5-2                                                                                                                                                                                                                                                                                              | 0                 | .011               | Weighted      | Average <sup>2/</sup> | 1.46          | :07                                | 1.14         | .307          |
| 5-3                                                                                                                                                                                                                                                                                              | 1.57              | 1.322              |               |                       |               | :11                                | 1.09         | .382          |
| 5-4, 8                                                                                                                                                                                                                                                                                           | 0                 | .042               |               |                       |               | :19                                | .957         | .519          |
| 5-9                                                                                                                                                                                                                                                                                              | .98               | .249               |               |                       |               | :30                                | .706         | .671          |
| 5-10                                                                                                                                                                                                                                                                                             | 0                 | .012               |               |                       |               | :46                                | .468         | .824          |
| 5-11                                                                                                                                                                                                                                                                                             | 3.68              | 2.946              |               |                       |               | 10:01                              | .362         | .926          |
| 5-12 <sup>1/</sup>                                                                                                                                                                                                                                                                               | 0                 | .267               |               |                       |               | :10                                | .321         | .977          |
| 5-13 <sup>1/</sup>                                                                                                                                                                                                                                                                               | .04               | .004               |               |                       |               | :35                                | .243         | 1.094         |
| Watershed Conditions: 32% of area bedded for cotton, no crop growing; 7% row grain sorghum 8" high; 29% oats-clover, oats 40" high in dough stage, clover growing; 31% Bermuda grass and weed pasture, grass and weeds 12" high, good cover; 1% gravel roads; cropland terraced, contour tilled. |                   |                    |               |                       |               | :51                                | .196         | 1.152         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 11:13                              | .133         | 1.211         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 12:12p                             | .0633        | 1.305         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | :46                                | .0362        | 1.334         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 2:50                               | .0135        | 1.382         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 4:40                               | .0062        | 1.399         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 6:00                               | .0040        | 1.406         |
|                                                                                                                                                                                                                                                                                                  |                   |                    |               |                       |               | 12:00m                             | .0015        | 1.420         |
| Event of June 4, 5, 1957                                                                                                                                                                                                                                                                         |                   |                    |               |                       |               |                                    |              |               |
| 5-4, 7-57                                                                                                                                                                                                                                                                                        | 0                 | 0.039              | 6-4-57        | Raingage              | 69            | 6-4-57                             |              |               |
| 5-8                                                                                                                                                                                                                                                                                              | .03               | .003               | 3:48p         | 0                     | 0             | 3:52p                              | 0.0007       | 0             |
| 5-9                                                                                                                                                                                                                                                                                              | .97               | .249               | :52           | 2.55                  | .17           | :56                                | .0015        | T             |
| 5-10                                                                                                                                                                                                                                                                                             | 0                 | .012               | :54           | 3.30                  | .28           | :59                                | .0029        | T             |
| 5-11                                                                                                                                                                                                                                                                                             | 3.66              | 2.946              | :59           | 3.48                  | .57           | 4:01                               | .0055        | T             |
| 5-12                                                                                                                                                                                                                                                                                             | 0                 | .267               | 4:02          | 7.00                  | .92           | :04                                | .0166        | .001          |
| 5-13                                                                                                                                                                                                                                                                                             | 1.62              | 1.424              | :04           | 4.80                  | 1.08          | :06                                | .0314        | .002          |
| 5-14, 15                                                                                                                                                                                                                                                                                         | 0                 | .026               | :10           | 2.60                  | 1.34          | :08                                | .0525        | .003          |
| 5-16                                                                                                                                                                                                                                                                                             | .03               | .003               | :13           | 1.00                  | 1.39          | :12                                | .226         | .010          |
| 5-17                                                                                                                                                                                                                                                                                             | 0                 | .002               | :15           | 3.60                  | 1.51          | :14                                | .508         | .021          |
| 5-18                                                                                                                                                                                                                                                                                             | .02               | .002               | :19           | 2.10                  | 1.65          | :16                                | .866         | .044          |
| 5-19, 22                                                                                                                                                                                                                                                                                         | 0                 | .007               | :27           | .45                   | 1.71          | :18                                | 1.08         | .077          |
| 5-23                                                                                                                                                                                                                                                                                             | .12               | .002               | 5:00          | .02                   | 1.72          | :20                                | 1.21         | .115          |
| 5-24                                                                                                                                                                                                                                                                                             | 0                 | .001               | Raingage      | 75A                   | 2.02          | :22                                | 1.35         | .157          |
| 5-25                                                                                                                                                                                                                                                                                             | .01               | .001               | Raingage      | 84A                   | 2.08          | :24                                | 1.50         | .205          |
| 5-26                                                                                                                                                                                                                                                                                             | .09               | I                  | Weighted      | Average <sup>2/</sup> | 1.85          | :25                                | 1.55         | .230          |
| 5-27, 31                                                                                                                                                                                                                                                                                         | 0                 | I                  |               |                       |               | :26                                | 1.59         | .256          |
| 6-1                                                                                                                                                                                                                                                                                              | .87               | .006               |               |                       |               | :29                                | 1.59         | .336          |
| 6-2                                                                                                                                                                                                                                                                                              | 0                 | .001               |               |                       |               | :31                                | 1.55         | .389          |
| 6-3                                                                                                                                                                                                                                                                                              | .37               | .005               |               |                       |               | :35                                | 1.40         | .487          |
| 6-4                                                                                                                                                                                                                                                                                              | .24 <sup>3/</sup> | .009 <sup>4/</sup> |               |                       |               | :39                                | 1.27         | .577          |

Notes: To convert runoff in in/hr to cfs, multiply by 80.54. 1/ Prior to event beginning 8:20a. 2/ Thiessen method. 3/ Prior rainfall ended 12:00a. 4/ Runoff prior to 3:52p.

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                   |                      |                    | Riesel (Waco), Texas |                      |                  | Watershed Y-4    |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    | Rainfall             |                      |                  | Runoff           |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                     | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 4, 5, 1957 - Continued                                                                                                                                                                                                                                                                                                                                                                     |                      |                    |                      |                      |                  |                  |                 |                  |
| Watershed Conditions: 32% in<br>cotton planted last week of May; 7%<br>row grain sorghum 24" high, culti-<br>vated mid-May; 29% oats-clover, oats<br>harvested, clover growing, 12" high;<br>3% Bermuda grass and weed pasture,<br>12" high, good cover; 1% gravel roads;<br>cropland terraced, contour tilled.                                                                                          |                      |                    |                      |                      |                  | 6-4-57           |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 4:45p            | 1.03            | 0.692            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 5:1              | .818            | .784             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 5:00             | .582            | .888             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 5:0              | .475            | .941             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 5:18             | .315            | 1.019            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 5:26             | .249            | 1.057            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 5:44             | .158            | 1.117            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 6:05             | .104            | 1.162            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 6:20             | .0788           | 1.185            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 7:40             | .0525           | 1.206            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 7:45             | .0268           | 1.247            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 9:12             | .0135           | 1.276            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 12:00m           | .0052           | 1.300            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 6-5-47           |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 5:30a            | .0020           | 1.318            |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 11:00            | .0010           | 1.327            |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                                                                                                                                                               |                      |                    |                      |                      |                  |                  |                 |                  |
| 5-23-59                                                                                                                                                                                                                                                                                                                                                                                                  | 0.21                 | 0.030              | 6-23-59              | Raingage             | 0                | 6-23-59          |                 |                  |
| 5-24                                                                                                                                                                                                                                                                                                                                                                                                     | .04                  | .001               | 8:45p                |                      | 0                | 9:51p            | T               | 0                |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                                     | T                    | T                  | 5:48                 | 4.00                 | .20              | 5:58             | .0026           | T                |
| 6-2                                                                                                                                                                                                                                                                                                                                                                                                      | .18                  | 0                  | 5:56                 | 3.00                 | .60              | 10:08            | .0066           | .001             |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                                      | .02                  | 0                  | 9:1                  | 1.50                 | .70              | 1:1              | .0166           | .002             |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                                      | 1.45                 | .032               | 5:1                  | 5.70                 | .89              | 5:25             | .0314           | .006             |
| 6-5                                                                                                                                                                                                                                                                                                                                                                                                      | .65                  | .069               | 5:42                 | 1.50                 | .99              | 5:29             | .0561           | .009             |
| 6-6, 7                                                                                                                                                                                                                                                                                                                                                                                                   |                      | .005               | 5:4                  | 3.00                 | 1.19             | 5:31             | .100            | .011             |
| 6-12                                                                                                                                                                                                                                                                                                                                                                                                     | .16                  | 0                  | 5:49                 | 2.00                 | 1.29             | 5:33             | .133            | .015             |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                                     | .74                  | 0                  | 5:52                 | 4.00                 | 1.49             | 5:35             | .199            | .021             |
| 6-22                                                                                                                                                                                                                                                                                                                                                                                                     | .37                  | 0                  | 5:55                 | 2.00                 | 1.59             | 5:38             | .276            | .033             |
| 6-23                                                                                                                                                                                                                                                                                                                                                                                                     | 0                    | T                  | 5:58                 | 4.4                  | 1.81             | 5:40             | .343            | .043             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 10:05                | .51                  | 1.87             | 5:43             | .415            | .062             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 11:1                 | 1.20                 | 1.99             | 5:46             | .580            | .085             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 1:16                 | 2.28                 | 2.18             | 5:49             | .669            | .114             |
| Watershed Conditions: 2% in<br>cotton, good stand 16" high,<br>beginning to bloom, last culti-<br>vation mid-June; 22% oats-clover,<br>oats harvested, clover growing, 12"<br>high; 38% row grain sorghum 5' high,<br>good stand, grain in dough stage,<br>last cultivation mid-May; 31% Bermuda<br>grass pasture, grass 10" high, good<br>cover; 1% gravel roads; cropland<br>terraced, contour tilled. |                      |                    | 5:2                  | 3.00                 | 2.38             | 5:51             | .734            | .137             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 5:25                 | 2.40                 | 2.58             | 5:55             | .789            | .188             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 5:31                 | 2.00                 | 2.78             | 5:58             | .789            | .227             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 5:36                 | .72                  | 2.84             | 11:05            | .715            | .315             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 5:39                 | 2.80                 | 2.90             | 1:15             | .573            | .423             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 5:43                 | 1.50                 | 3.00             | 1:27             | .444            | .525             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | Raingage             | 698                  | 2.95             | 1:43             | .328            | .629             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | Raingage             | 75A                  | 2.79             | 12:00m           | .241            | .709             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | Raingage             | 84A                  | 2.89             | 6-24-59          |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | Weighted             | Average              | 2.94             | 12:21a           | .153            | .777             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 1:10             | .0748           | .866             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 2:19             | .0298           | .922             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 3:20             | .0155           | .945             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 4:32             | .0078           | .958             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 5:33             | .0040           | .964             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 7:04             | .0020           | .968             |
|                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                      |                      |                  | 9:49             | .0007           | .972             |
| Notes: To convert runoff in in/hr to cfs, multiply by 86.54. 1/ Runoff prior to 9:51p. 2/ Thiessen method.                                                                                                                                                                                                                                                                                               |                      |                    |                      |                      |                  |                  |                 |                  |



RIESEL (WACO), TEXAS Watershed Y-4

| MONTHLY PRECIPITATION AND RUNOFF (Inches) |             |             |             |               |              |              |             | Riesel (Waco), Texas |             |              |              |             |                |  | Watershed Y-6<br>(Area - 16.3 acres) |  |
|-------------------------------------------|-------------|-------------|-------------|---------------|--------------|--------------|-------------|----------------------|-------------|--------------|--------------|-------------|----------------|--|--------------------------------------|--|
| Month<br>Year                             | Jan.        | Feb.        | Mar.        | Apr.          | May          | June         | July        | Aug.                 | Sept.       | Oct.         | Nov.         | Dec.        | Year           |  |                                      |  |
| 1957<br>P<br>Q                            | 2.16<br>0   | 2.45<br>0   | 0.38<br>0   | 0.64<br>0     | 4.42<br>.09  | 1.93<br>0    | 1.99<br>0   | 2.54<br>0            | 0<br>0      | 0.37<br>0    | 4.53<br>.31  | 2.02<br>0   | 23.43<br>.40   |  |                                      |  |
| 1958<br>P<br>Q                            | 1.53<br>0   | 3.10<br>.01 | 5.20<br>.19 | 14.69<br>8.15 | 8.36<br>5.40 | 5.10<br>1.19 | 1<br>0      | 1.18<br>0            | 4.15<br>0   | 8.39<br>3.09 | 4.71<br>1.10 | .85<br>.02  | 57.56<br>19.15 |  |                                      |  |
| 1958<br>P<br>Q                            | 1.75<br>.06 | 3.50<br>.70 | 1.39<br>.05 | 3.31<br>.02   | 1.89<br>.43  | 2.47<br>0    | .99<br>0    | 6.39<br>1            | 5.01<br>.13 | 3.02<br>.21  | 1.35<br>0    | 1.40<br>0   | 32.47<br>1.60  |  |                                      |  |
| 1959<br>P<br>Q                            | .38<br>0    | 3.34<br>.31 | .93<br>0    | 4.01<br>.50   | 3.91<br>.14  | 7.14<br>.89  | 4.45<br>.01 | 3.33<br>0            | 1.89<br>0   | 6.89<br>1.45 | 2.02<br>.57  | 3.54<br>.56 | 41.83<br>4.43  |  |                                      |  |

| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS |                   |      |                                           |      |         |      |         |      | Riesel (Waco), Texas |      |       |      | Watershed Y-6 |      |        |      |
|-------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|----------------------|------|-------|------|---------------|------|--------|------|
| YEAR                                                                                                                    | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |                      |      |       |      |               |      |        |      |
|                                                                                                                         |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours             |      | 1 day |      | 2 days        |      | 8 days |      |
|                                                                                                                         | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date                 | Vol. | Date  | Vol. | Date          | Vol. | Date   | Vol. |
| 1957                                                                                                                    | 4-19              | 1.64 | 4-19                                      | 1.37 | 4-19    | 1.99 | 4-23    | 2.65 | 5-11                 | 2.87 | 5-11  | 2.90 | 4-23          | 4.26 | 4-19   | 8.49 |
| 1958                                                                                                                    | 10-21             | .14  | 10-21                                     | .11  | 10-21   | .17  | 5-3     | .23  | 5-3                  | .35  | 2-22  | .47  | 2-22          | .60  | 2-21   | .68  |
| 1959                                                                                                                    | 6-23              | 1.03 | 6-23                                      | .61  | 6-23    | .73  | 10-4    | .90  | 10-4                 | 1.26 | 10-4  | 1.30 | 10-4          | 1.32 | 10-4   | 1.32 |

Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volumes, excellent. Watershed conditions: area changed to 16.3 acres Jan. 1956. Cultivated land use changed to single crop by year as follows: grain sorghum - 1956 and 1959, oats and clover - 1957, cotton - 1958. See page 42.14-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, SWC, June 1957 (reprinted 1961).

| SELECTED RUNOFF EVENTS                                                                                                                                           |                   |                 |               |                       |               | Riesel (Waco), Texas<br>Watershed Y-6 |              |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-----------------------|---------------|---------------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                            |                   |                 | Rainfall      |                       |               | Runoff                                |              |               |
| Date                                                                                                                                                             | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                         | Rate (in/hr) | Acc. (inches) |
| Event of April 24, 1957                                                                                                                                          |                   |                 |               |                       |               |                                       |              |               |
| 3-27-57                                                                                                                                                          | 0.93              | 0.002           | 4-24-57       | Raingage              | .75A          | 4-24-57                               |              |               |
| 3-28                                                                                                                                                             | 0                 | T               | 2:35p         | 0                     |               | 2:30p                                 | T            |               |
| 3-31                                                                                                                                                             | 1.30              | .137            | :39           | 1.20                  | .04           | :39                                   | .0023        | T             |
| 4-1                                                                                                                                                              | 0                 | .006            | :45           | 2.50                  | .29           | :48                                   | .0148        |               |
| 4-3                                                                                                                                                              | .27               | 0               | :48           | 1.60                  | .37           | :51                                   | .0217        | .001          |
|                                                                                                                                                                  |                   |                 |               |                       |               |                                       |              | .002          |
| 4-4                                                                                                                                                              | .03               | 0               | :50           | 3.60                  | .49           | :54                                   | .0639        | .004          |
| 4-8                                                                                                                                                              | .03               |                 | :54           | 4.35                  | .78           | :56                                   | .124         | .007          |
| 4-13                                                                                                                                                             | .05               | 0               | :57           | 2.00                  | .88           | :58                                   | .195         | .012          |
| 4-15                                                                                                                                                             | .03               | 0               | 3:00          | 3.60                  | 1.06          | 3:00                                  | .350         | .021          |
| 4-19                                                                                                                                                             | 4.94              | 2.058           | :03           | 3.00                  | 1.21          | :02                                   | .455         | .034          |
| 4-20                                                                                                                                                             | .28               | .386            | :06           | 3.40                  | 1.38          | :04                                   | .583         | .052          |
| 4-21                                                                                                                                                             | .20               |                 | :10           | 2.85                  | 1.59          | :06                                   | .742         | .074          |
| 4-22                                                                                                                                                             | .32               | .001            | :17           | .94                   | 1.68          | :10                                   | .949         | .131          |
| 4-23                                                                                                                                                             | 3.83              | 2.819           | :23           | .80                   | 1.76          | :17                                   | 1.05         | .249          |
| 4-24                                                                                                                                                             | .02               | .006            | 4:03          | .12                   | 1.84          | :19                                   | 1.05         | .284          |
| Watershed Conditions: 94% of area in oats-clover, good cover, oats 20" high, in bloom stage; 4% sodded waterway, good cover; 2% gravel roads; terraced cropland. |                   |                 |               |                       |               |                                       |              |               |
|                                                                                                                                                                  |                   |                 | Raingage      | 69                    | 1.81          | :27                                   | .967         | .418          |
|                                                                                                                                                                  |                   |                 | Weighted      | Average <sup>2/</sup> | 1.84          | :40                                   | .797         | .610          |
|                                                                                                                                                                  |                   |                 |               |                       |               | :53                                   | .615         | .762          |
|                                                                                                                                                                  |                   |                 |               |                       |               | 4:04                                  | .502         | .864          |
|                                                                                                                                                                  |                   |                 |               |                       |               | :19                                   | .381         | .973          |
|                                                                                                                                                                  |                   |                 |               |                       |               | :38                                   | .276         | 1.078         |
|                                                                                                                                                                  |                   |                 |               |                       |               | 5:09                                  | .176         | 1.192         |
|                                                                                                                                                                  |                   |                 |               |                       |               | 6:00                                  | .0846        | 1.298         |
|                                                                                                                                                                  |                   |                 |               |                       |               | 7:04                                  | .0401        | 1.360         |
|                                                                                                                                                                  |                   |                 |               |                       |               | 8:15                                  | .0186        | 1.392         |
|                                                                                                                                                                  |                   |                 |               |                       |               | 10:30                                 | .0066        | 1.418         |
|                                                                                                                                                                  |                   |                 |               |                       |               | 12:00m                                | .0038        | 1.425         |

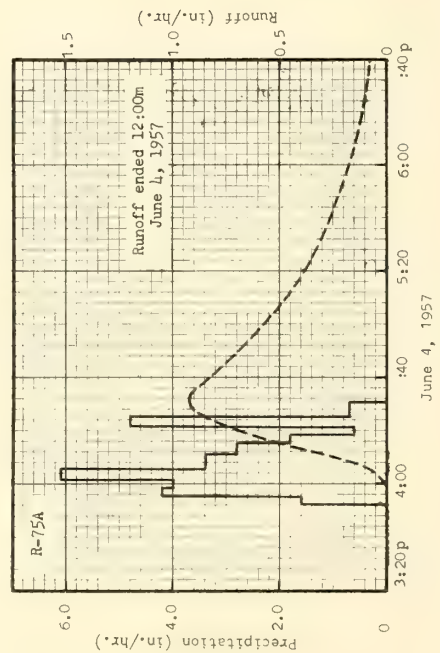
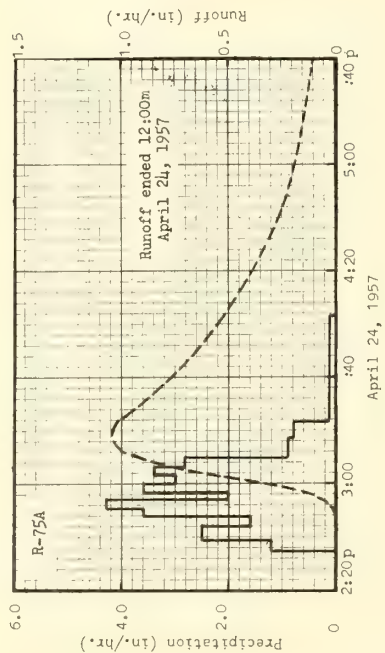
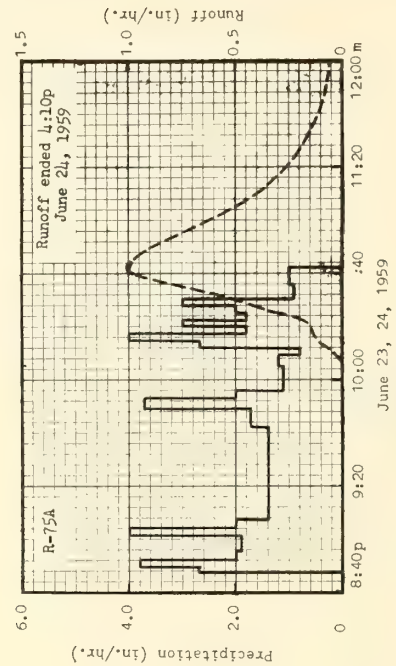
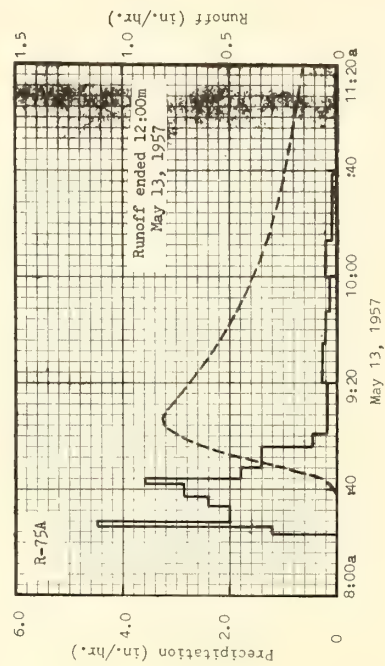
Notes: To convert runoff in in/hr to cfs, multiply by 16.43. 1/ Prior to event beginning 2:35p. 2/ Thiessen method. For map of watershed, see page 42.11-5.



| SELECTED RUNOFF EVENTS                                                                                                                                                                                                 |                   |                    |               |                       |               | Riesel (Waco), Texas Watershed Y-6 |              |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|---------------|-----------------------|---------------|------------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                  |                   |                    | Rainfall      |                       |               | Runoff                             |              |               |
| Date                                                                                                                                                                                                                   | Rainfall (inches) | Runoff (inches)    | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                      | Rate (in/hr) | Acc. (inches) |
| Event of May 13, 1957                                                                                                                                                                                                  |                   |                    |               |                       |               |                                    |              |               |
| 4-13-57                                                                                                                                                                                                                | 0.05              | 0                  | 5-13-57       | Raingage              | 75A           | 5-13-57                            |              |               |
| 4-15                                                                                                                                                                                                                   | .03               | 0                  | 8:23a         | 0                     | 0             | 8:00a                              | 0.0006       | 0             |
| 4-19                                                                                                                                                                                                                   | 4.94              | 2.058              | :26           | 1.20                  | .06           | :30                                | .0047        | T             |
| 4-20                                                                                                                                                                                                                   | .28               | .386               | :28           | 4.50                  | .21           | :38                                | .0166        | .002          |
| 4-21                                                                                                                                                                                                                   | .20               | 0                  | :33           | 2.04                  | .38           | :43                                | .0472        | .004          |
| 4-22                                                                                                                                                                                                                   | .32               | .001               | :37           | 2.40                  | .54           | :45                                | .124         | .006          |
| 4-23                                                                                                                                                                                                                   | 3.83              | 2.819              | :42           | 2.88                  | .78           | :48                                | .262         | .016          |
| 4-24                                                                                                                                                                                                                   | 1.86              | 1.431              | :44           | 3.60                  | .90           | :50                                | .350         | .026          |
| 4-25                                                                                                                                                                                                                   | 0                 | .018               | :48           | 1.80                  | 1.02          | :57                                | .669         | .087          |
| 4-26                                                                                                                                                                                                                   | 1.26              | .384               | :56           | 1.42                  | 1.21          | 9:03                               | .797         | .160          |
| 4-27                                                                                                                                                                                                                   | .28               | .393               | 9:01          | .48                   | 1.25          | :07                                | .803         | .214          |
| 4-28                                                                                                                                                                                                                   | 1.24              | .528               | :20           | .19                   | 1.31          | :10                                | .797         | .254          |
| 4-29                                                                                                                                                                                                                   | .04               | .118               | :35           | .24                   | 1.37          | :27                                | .633         | .456          |
| 4-30                                                                                                                                                                                                                   | .03               | .006               | :47           | .20                   | 1.41          | :45                                | .486         | .622          |
| 5-1                                                                                                                                                                                                                    | .24               | .016               | 10:00         | .18                   | 1.45          | 10:20                              | .319         | .857          |
| 5-2                                                                                                                                                                                                                    | 0                 | .006               | :14           | .21                   | 1.50          | :55                                | .206         | 1.008         |
| 5-3                                                                                                                                                                                                                    | 1.42              | 1.008              | :39           | .14                   | 1.56          | 11:49                              | .0967        | 1.140         |
| 5-4, 5                                                                                                                                                                                                                 | 0                 | .024               | Raingage      | 69                    | 1.58          | 12:45p                             | .0472        | 1.204         |
| 5-8                                                                                                                                                                                                                    | .02               | 0                  | Weighted      | Average <sup>2/</sup> | 1.56          | 1:40                               | .0228        | 1.235         |
| 5-9                                                                                                                                                                                                                    | 1.01              | .119               |               |                       |               | 3:00                               | .0116        | 1.257         |
| 5-10                                                                                                                                                                                                                   | 0                 | .011               |               |                       |               | 4:45                               | .0066        | 1.273         |
| 5-11                                                                                                                                                                                                                   | 3.74              | 2.616              |               |                       |               | 12:00m                             | .0018        | 1.298         |
| 5-12 <sup>3/</sup>                                                                                                                                                                                                     | 0                 | .282               |               |                       |               |                                    |              |               |
| 5-13 <sup>4/</sup>                                                                                                                                                                                                     | .04               | .004               |               |                       |               |                                    |              |               |
| Watershed Conditions: 94% of area in oats-clover, oats 40" high in dough stage, clover growing; 4% sodded waterway; 2% gravel roads; terraced cropland.                                                                |                   |                    |               |                       |               |                                    |              |               |
| Event of June 4, 1957                                                                                                                                                                                                  |                   |                    |               |                       |               |                                    |              |               |
| 5-3-57                                                                                                                                                                                                                 | 1.42              | 1.008              | 5-4-57        | Raingage              | 75A           | 6-4-57                             |              |               |
| 5-4, 5                                                                                                                                                                                                                 | 0                 | .024               | 3:52p         | 0                     | 0             | 3:53p                              | .0012        | 0             |
| 5-8                                                                                                                                                                                                                    | .02               | 0                  | :55           | 1.60                  | .08           | :57                                | .0066        | T             |
| 5-9                                                                                                                                                                                                                    | 1.01              | .119               | :58           | 4.20                  | .29           | 4:00                               | .0148        | .001          |
| 5-10                                                                                                                                                                                                                   | 0                 | .011               | 4:01          | 4.05                  | .56           | :04                                | .0401        | .002          |
| 5-11                                                                                                                                                                                                                   | 3.74              | 2.616              | :05           | 6.15                  | .97           | :07                                | .131         | .006          |
| 5-12                                                                                                                                                                                                                   | 0                 | .282               | :11           | 3.40                  | 1.31          | :09                                | .249         | .012          |
| 5-13                                                                                                                                                                                                                   | 1.62              | 1.302              | :15           | 2.85                  | 1.50          | :11                                | .353         | .022          |
| 5-14, 15                                                                                                                                                                                                               | 0                 | .020               | :18           | 1.80                  | 1.59          | :15                                | .502         | .052          |
| 5-16                                                                                                                                                                                                                   | .05               | T                  | :21           | .60                   | 1.62          | :19                                | .633         | .090          |
| 5-17                                                                                                                                                                                                                   | 0                 | T                  | :25           | 4.80                  | 1.94          | :25                                | .852         | .165          |
| 5-18                                                                                                                                                                                                                   | .04               | T                  | :30           | .72                   | 2.00          | :30                                | .931         | .240          |
| 5-19, 20                                                                                                                                                                                                               | 0                 | T                  | 5:02          | .02                   | 2.02          | :32                                | .931         | .271          |
| 5-23                                                                                                                                                                                                                   | .13               | 0                  | Raingage      | 69                    | 1.72          | :39                                | .852         | .375          |
| 5-25                                                                                                                                                                                                                   | .02               | 0                  | Weighted      | Average <sup>2/</sup> | 2.01          | :49                                | .706         | .506          |
| 5-26                                                                                                                                                                                                                   | .08               | 0                  |               |                       |               | 5:01                               | .551         | .632          |
| 6-1                                                                                                                                                                                                                    | .97               | .004               |               |                       |               | :23                                | .360         | .794          |
| 6-2                                                                                                                                                                                                                    | 0                 | .002               |               |                       |               | :58                                | .186         | .946          |
| 6-3                                                                                                                                                                                                                    | .44               | .008               |               |                       |               | 6:12                               | .139         | .984          |
| 6-4                                                                                                                                                                                                                    | .19 <sup>3/</sup> | .019 <sup>4/</sup> |               |                       |               | :36                                | .0846        | 1.028         |
| Watershed Conditions: 94% of area in oats-clover, oats ripe, clover 12" high; 4% in sodded waterway; 2% gravel roads; terraced cropland.                                                                               |                   |                    |               |                       |               |                                    |              |               |
|                                                                                                                                                                                                                        |                   |                    |               |                       |               | 7:15                               | .0436        | 1.068         |
|                                                                                                                                                                                                                        |                   |                    |               |                       |               | :43                                | .0401        | 1.086         |
|                                                                                                                                                                                                                        |                   |                    |               |                       |               | :55                                | .0229        | 1.092         |
|                                                                                                                                                                                                                        |                   |                    |               |                       |               | 9:20                               | .0089        | 1.113         |
|                                                                                                                                                                                                                        |                   |                    |               |                       |               | 12:00m                             | .0029        | 1.127         |
| Notes: To convert runoff in in/hr to cfs, multiply by 16.43. <sup>1/</sup> Prior to event beginning 8:23a. <sup>2/</sup> Thiessen method, <sup>3/</sup> Rainfall prior to 11:30a. <sup>4/</sup> Runoff prior to 3:53p. |                   |                    |               |                       |               |                                    |              |               |

| SELECTED RUNOFF EVENTS                                                                                                                                                                         |                      |                    | Riesel (Waco), Texas |                      |                  | Watershed Y-6    |                 |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                          |                      |                    | Rainfall             |                      |                  | Runoff           |                 |                  |
| Date                                                                                                                                                                                           | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 23, 24, 1959                                                                                                                                                                     |                      |                    |                      |                      |                  |                  |                 |                  |
| 5-23-59                                                                                                                                                                                        | 0.23                 | 0.059              | 6-23-59              | Raingage             | 75A              | 6-23-59          |                 |                  |
| 5-24                                                                                                                                                                                           | .04                  | .006               | 8:47p                | 0                    | 0                | 9:45p            | T               | T                |
| 5-25                                                                                                                                                                                           | T                    |                    | :49                  | 2.70                 | .09              | :57              | .0102           | .003             |
| 6-2                                                                                                                                                                                            | .19                  |                    | :52                  | 3.80                 | .28              | 10:08            | .0253           | .003             |
| 6-3                                                                                                                                                                                            | .02                  | 0                  | :55                  | 2.00                 | .38              | :10              | .0418           | .004             |
| 6-4                                                                                                                                                                                            | 1.44                 | .053               | :1                   | 1.90                 | .57              | :12              | .0688           | .002             |
| 6-5                                                                                                                                                                                            | .63                  | .047               | :14                  | 4.00                 | .97              | :16              | .131            | .013             |
| 6-6                                                                                                                                                                                            |                      | .006               | :17                  | 2.00                 | .87              | :21              | .156            | .025             |
| 6-11                                                                                                                                                                                           | .16                  | 0                  | :42                  | 1.40                 | .89              | :24              | .237            | .035             |
| 6-20                                                                                                                                                                                           | .71                  | 0                  | :49                  | 1.72                 | 1.09             | :26              | .353            | .045             |
| 6-22                                                                                                                                                                                           | .36                  |                    | :53                  | 3.75                 | 1.34             | :28              | .425            | .058             |
| 6-23                                                                                                                                                                                           | .10                  |                    | :55                  | 2.00                 | 1.44             | :31              | .534            | .082             |
| Watershed Conditions: 34% of area in row grain sorghum, 5' high, grain in dough stage; last cultivation May 24; 5% in sodded waterway; 2% gravel roads; cropland terraced, tillage on contour. |                      |                    | :56                  | 1.14                 | 1.61             | :34              | .706            | .113             |
|                                                                                                                                                                                                |                      |                    | :58                  | 1.20                 | 1.69             | :38              | .894            | .167             |
|                                                                                                                                                                                                |                      |                    | :59                  | .80                  | 1.73             | :41              | 1.01            | .214             |
|                                                                                                                                                                                                |                      |                    | :14                  | 2.70                 | 1.83             | :43              | 1.03            | .248             |
|                                                                                                                                                                                                |                      |                    | :15                  | 4.00                 | 2.12             | :50              | .713            | .363             |
|                                                                                                                                                                                                |                      |                    | :17                  | 1.80                 | 2.11             | :59              | .669            | .482             |
|                                                                                                                                                                                                |                      |                    | :22                  | 3.00                 | 2.21             | 11:06            | .494            | .550             |
|                                                                                                                                                                                                |                      |                    | :25                  | 1.80                 | 2.3              | :12              | .367            | .593             |
|                                                                                                                                                                                                |                      |                    | :28                  | 2.00                 | 2.4              | :37              | .139            | .688             |
|                                                                                                                                                                                                |                      |                    | :30                  | 3.00                 | 2.90             | :50              | .0846           | .711             |
|                                                                                                                                                                                                |                      |                    | :36                  | .90                  | 2.59             | 12:00m           | .0593           | .723             |
|                                                                                                                                                                                                |                      |                    | :42                  | 1.00                 | 2.69             | 12:04-59         |                 |                  |
|                                                                                                                                                                                                |                      |                    | Raingage             | 69B                  | 2.87             | 12:24a           | .0279           | .741             |
|                                                                                                                                                                                                |                      |                    | Weighted             | Average <sup>2</sup> | 2.62             | :47              | .0148           | .749             |
|                                                                                                                                                                                                |                      |                    |                      |                      |                  | 1:31             | .0066           | .756             |
|                                                                                                                                                                                                |                      |                    |                      |                      |                  | 4:10             | .0012           | .764             |

Notes: To convert runoff in in/hr to cfs, multiply by 1.48. 1. Prior to event beginning 8:47p. 2/ Thiessen method.



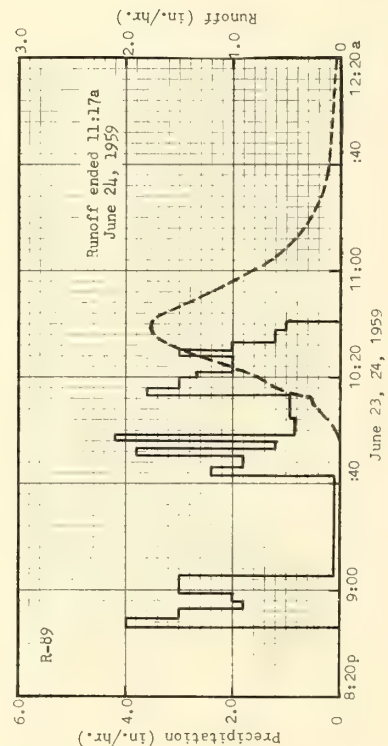
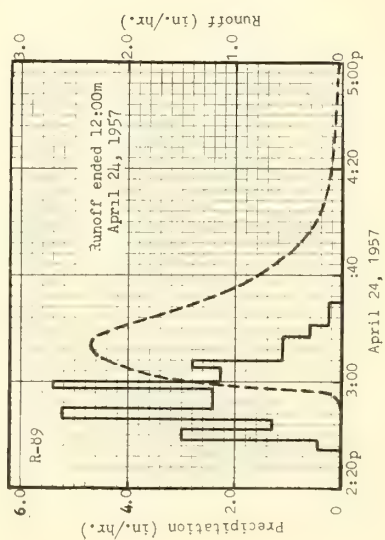
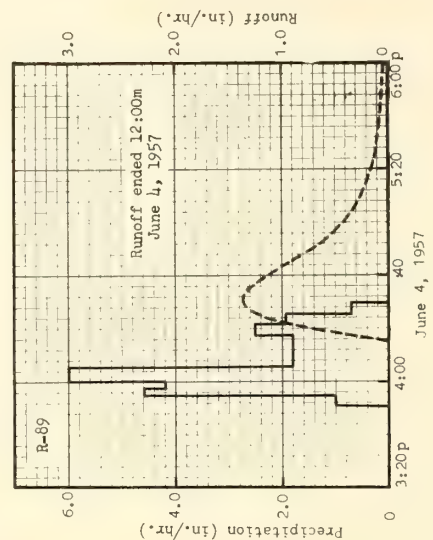
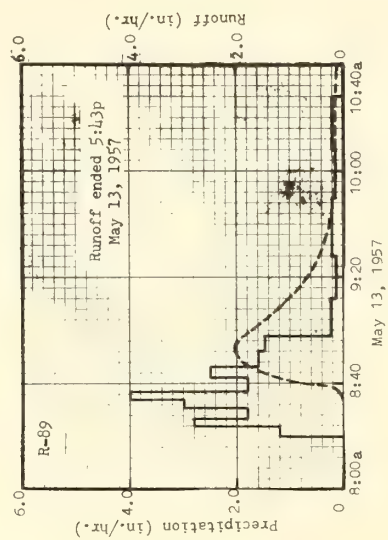
RIESEL (WACO), TEXAS WATERSHED Y-6

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                  |                   |              |                                           |               |               |                   |               | Riesel (Waco), Texas Watershed Y-7<br>(Area - 43.0 acres) |              |              |               |              |                |      |        |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|-------------------------------------------|---------------|---------------|-------------------|---------------|-----------------------------------------------------------|--------------|--------------|---------------|--------------|----------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                              | Jan.              | Feb.         | Mar.                                      | Apr.          | May           | June              | July          | Aug.                                                      | Sept.        | Oct.         | Nov.          | Dec.         | Year           |      |        |      |
| 1956<br>P<br>Q                                                                                                                                                                                                                                                                                                             | 2.15<br>0         | 2.46<br>0    | 0.46<br>0                                 | 1.14<br>0     | 4.35<br>0     | 1.78<br>0         | 1.90<br>0     | 2.45<br>0                                                 | 0<br>0       | 0.28<br>0    | 4.41<br>.24   | 2.02<br>0    | 23.00<br>.30   |      |        |      |
| 1957<br>P<br>Q                                                                                                                                                                                                                                                                                                             | 1.44<br>0         | 3.19<br>.1   | 1.15<br>.81                               | 15.00<br>4.84 | 8.36<br>5.58  | 4.53<br>.91       | 1.05<br>0     | 1.3<br>0                                                  | 4.07<br>0    | 8.13<br>1.97 | 4.64<br>1.14  | 1.90<br>0    | 56.89<br>20.01 |      |        |      |
| 1958<br>P<br>Q                                                                                                                                                                                                                                                                                                             | 1.74<br>.02       | 3.35<br>1.19 | 1.37<br>.01                               | 3.27<br>.01   | 1.44<br>.88   | 2.31<br>0         | 1.17<br>0     | 6.21<br>.34                                               | 4.35<br>.48  | 2.78<br>.19  | 1.45<br>T     | 1.53<br>T    | 31.95<br>3.12  |      |        |      |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                                                                             | .42<br>T          | 3.49<br>.59  | 1.03<br>T                                 | 4.19<br>.82   | 3.98<br>.52   | 7.10<br>1.98      | 4.4<br>.32    | 3.22<br>.01                                               | 2.03<br>T    | 7.04<br>1.95 | 1.91<br>.73   | 3.64<br>1.05 | 42.48<br>7.97  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                    |                   |              |                                           |               |               |                   |               | Riesel (Waco), Texas Watershed Y-7                        |              |              |               |              |                |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                       | MAXIMUM DISCHARGE |              | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |               |               |                   |               |                                                           |              |              |               |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              | 1 hour                                    |               | 2 hours       |                   | 6 hours       |                                                           | 12 hours     |              | 1 day         |              | 2 days         |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                            | Date              | Rate         | Date                                      | Vol.          | Date          | Vol.              | Date          | Vol.                                                      | Date         | Vol.         | Date          | Vol.         | Date           | Vol. | Date   | Vol. |
| 1957                                                                                                                                                                                                                                                                                                                       | 4-19              | 3.15         | 4-19                                      | 2.34          | 4-19          | 2.76              | 4-23          | 3.28                                                      | 4-23         | 3.31         | 4-23          | 3.31         | 4-23           | 4.86 | 4-19   | 8.89 |
| 1958                                                                                                                                                                                                                                                                                                                       | 5-3               | .24          | 5-3                                       | .20           | 5-3           | .35               | 5-3           | .59                                                       | 5-3          | .79          | 2-22          | 1.11         | 2-22           | 1.17 | 2-21   | 1.19 |
| 1959                                                                                                                                                                                                                                                                                                                       | 6-23              | 1.76         | 6-23                                      | 1.10          | 6-23          | 1.27              | 6-23          | 1.35                                                      | 6-23         | 1.36         | 6-23          | 1.37         | 6-23           | 1.56 | 6-23   | 1.56 |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. Discharge and Volume, excellent. Watershed conditions: no noticeable change in land use or vegetation since 1956. See page L2.11-1, Monthly Precipitation for Small Agricultural Watersheds in the United States, ARS, Gwo, June 1957 (reprinted 1961). |                   |              |                                           |               |               |                   |               |                                                           |              |              |               |              |                |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                     |                   |              |                                           |               |               |                   |               | Riesel (Waco), Texas Watershed Y-7                        |              |              |               |              |                |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                      |                   |              |                                           | Rainfall      |               |                   |               | Runoff                                                    |              |              |               |              |                |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                       | Rainfall (inches) |              | Runoff (inches)                           |               | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                                             | Rate (in/hr) |              | Acc. (inches) |              |                |      |        |      |
| Event of April 24, 1957                                                                                                                                                                                                                                                                                                    |                   |              |                                           |               |               |                   |               |                                                           |              |              |               |              |                |      |        |      |
| 3-27-57                                                                                                                                                                                                                                                                                                                    | 0.93              |              | 0.100                                     |               | 4-24-57       | Raingage          | 89            | 4-24-57                                                   |              |              |               |              |                |      |        |      |
| 3-28                                                                                                                                                                                                                                                                                                                       |                   |              | .001                                      |               | 2:34p         | 0                 |               | 2:43p                                                     | 0.0005       |              |               |              |                |      |        |      |
| 3-31                                                                                                                                                                                                                                                                                                                       | 1.32              |              | .257                                      |               | :38           | .45               | .03           | :48                                                       | .0037        |              | T             |              |                |      |        |      |
| 4-1                                                                                                                                                                                                                                                                                                                        | 0                 |              | .004                                      |               | :42           | 3.00              | .23           | :51                                                       | .0077        |              | T             |              |                |      |        |      |
| 4-3                                                                                                                                                                                                                                                                                                                        | .02               |              | 0                                         |               | :4            | 1.35              | .32           | :54                                                       | .0233        |              | .11           |              |                |      |        |      |
| 4-4                                                                                                                                                                                                                                                                                                                        | .02               |              |                                           |               | :5            | 5.25              | .67           | :56                                                       | .167         |              | .004          |              |                |      |        |      |
| 4-12                                                                                                                                                                                                                                                                                                                       |                   |              | 0                                         |               | :58           | 2.4               | .99           | :58                                                       | .845         |              | .021          |              |                |      |        |      |
| 4-15                                                                                                                                                                                                                                                                                                                       | .03               |              | 0                                         |               | 3:00          | 5.40              | 1.17          | 3:00                                                      | 1.37         |              | .058          |              |                |      |        |      |
| 4-19                                                                                                                                                                                                                                                                                                                       | 5.01              |              | 2.782                                     |               | :05           | 2.28              | 1.36          | :02                                                       | 1.76         |              | .111          |              |                |      |        |      |
| 4-20                                                                                                                                                                                                                                                                                                                       | .24               |              | .170                                      |               | :08           | 2.80              | 1.50          | :04                                                       | 1.95         |              | .173          |              |                |      |        |      |
| 4-21                                                                                                                                                                                                                                                                                                                       | .21               |              | .006                                      |               | :17           | 1.14              | 1.67          | :07                                                       | 2.16         |              | .276          |              |                |      |        |      |
| 4-22                                                                                                                                                                                                                                                                                                                       | .31               |              | .055                                      |               | :21           | .60               | 1.74          | :12                                                       | 2.35         |              | .465          |              |                |      |        |      |
| 4-23                                                                                                                                                                                                                                                                                                                       | 4.04              |              | 3.313                                     |               | :30           | .27               | 1.78          | :14                                                       | 2.36         |              | .543          |              |                |      |        |      |
| 4-24                                                                                                                                                                                                                                                                                                                       | .04               |              | .001                                      |               | 4:30          | .03               | 1.81          | :18                                                       | 2.25         |              | .698          |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               | Raingage      | W-2A              | 1.75          | :22                                                       | 2.01         |              | .840          |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               | Weighted      | Average           | 1.80          | :28                                                       | 1.55         |              | 1.019         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :32                                                       | 1.28         |              | 1.115         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :36                                                       | 1.03         |              | 1.142         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :39                                                       | .845         |              | 1.239         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :43                                                       | .664         |              | 1.289         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :51                                                       | .407         |              | 1.358         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :58                                                       | .268         |              | 1.397         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | 4:05                                                      | .198         |              | 1.424         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :17                                                       | .117         |              | 1.455         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :4                                                        | .0630        |              | 1.489         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :9                                                        | .0407        |              | 1.504         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | 5:14                                                      | .0253        |              | 1.513         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | :43                                                       | .0134        |              | 1.522         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | 6:09                                                      | .0087        |              | 1.526         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | 8:02                                                      | .0021        |              | 1.536         |              |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                            |                   |              |                                           |               |               |                   |               | 12:00                                                     | .0006        |              | 1.54          |              |                |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 4.732. 1/ Prior to event beginning 2:34p. 2/ Thiessen method. For map of watershed, see page L2.11-5.                                                                                                                                                                |                   |              |                                           |               |               |                   |               |                                                           |              |              |               |              |                |      |        |      |



| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                       |                   |                 |               |                       |               | Riesel (Waco), Texas Watershed Y-7 |              |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-----------------------|---------------|------------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                                        |                   |                 | Rainfall      |                       |               | Runoff                             |              |               |
| Date                                                                                                                                                                                                                                                                                         | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                      | Rate (in/hr) | Acc. (inches) |
| Event of May 13, 1957                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               |                                    |              |               |
| 4-13-57                                                                                                                                                                                                                                                                                      | 0.06              | 0               | 5-13-57       | Raingage              | 89            | 5-13-57                            |              |               |
| 4-15                                                                                                                                                                                                                                                                                         | .03               | 0               | 8:20a         | 0                     | 0             | 8:20a                              | T            | 0             |
| 4-19                                                                                                                                                                                                                                                                                         | 5.01              | 2.782           | :24           | 1.20                  | .08           | :28                                | .0007        | T             |
| 4-20                                                                                                                                                                                                                                                                                         | .24               | .170            | :27           | 2.80                  | .22           | :30                                | .0027        | T             |
| 4-21                                                                                                                                                                                                                                                                                         | .21               | .006            | :31           | 1.80                  | .34           | :32                                | .0072        | T             |
| 4-22                                                                                                                                                                                                                                                                                         | .31               | .055            | :34           | 3.00                  | .49           | :34                                | .0120        | .001          |
| 4-23                                                                                                                                                                                                                                                                                         | 4.04              | 3.313           | :37           | 4.00                  | .69           | :37                                | .0322        | .002          |
| 4-24                                                                                                                                                                                                                                                                                         | 1.86              | 1.541           | :42           | 1.80                  | .84           | :39                                | .278         | .005          |
| 4-25                                                                                                                                                                                                                                                                                         | 0                 | .003            | :46           | 2.55                  | 1.01          | :41                                | .855         | .024          |
| 4-26                                                                                                                                                                                                                                                                                         | 1.41              | .717            | :52           | 1.60                  | 1.17          | :44                                | 1.49         | .084          |
| 4-27                                                                                                                                                                                                                                                                                         | .27               | .304            | :58           | 1.50                  | 1.32          | :47                                | 1.82         | .168          |
| 4-28                                                                                                                                                                                                                                                                                         | 1.19              | .674            | 9:12          | .26                   | 1.38          | :52                                | 2.03         | .330          |
| 4-29                                                                                                                                                                                                                                                                                         | .05               | .016            | :28           | .15                   | 1.42          | :53                                | 2.03         | .364          |
| 4-30                                                                                                                                                                                                                                                                                         | .01               | T               | :50           | .27                   | 1.52          | :58                                | 1.89         | .528          |
| 5-1                                                                                                                                                                                                                                                                                          | .33               | .103            | 10:08         | .17                   | 1.57          | 9:04                               | 1.57         | .700          |
| 5-2                                                                                                                                                                                                                                                                                          | 0                 | T               | :28           | .21                   | 1.64          | :08                                | 1.33         | .796          |
| 5-3                                                                                                                                                                                                                                                                                          | 1.18              | .639            | :58           | .04                   | 1.66          | :12                                | 1.08         | .876          |
| 5-4                                                                                                                                                                                                                                                                                          | 0                 | .001            | Raingage      | W-2A                  | 1.66          | :16                                | .855         | .941          |
| 5-8                                                                                                                                                                                                                                                                                          | .04               | 0               | Weighted      | Average <sup>2/</sup> | 1.66          | :20                                | .674         | .993          |
| 5-9                                                                                                                                                                                                                                                                                          | .97               | .251            |               |                       |               | :24                                | .531         | 1.033         |
| 5-10                                                                                                                                                                                                                                                                                         | 0                 | .002            |               |                       |               | :28                                | .426         | 1.064         |
| 5-11                                                                                                                                                                                                                                                                                         | 3.83              | 3.096           |               |                       |               | :34                                | .322         | 1.102         |
| 5-12 <sup>1/</sup>                                                                                                                                                                                                                                                                           | 0                 | .039            |               |                       |               | :50                                | .205         | 1.169         |
| 5-13 <sup>1/</sup>                                                                                                                                                                                                                                                                           | 0                 | T               |               |                       |               | 10:01                              | .188         | 1.205         |
| Watershed Conditions: 50% of area bedded for cotton, no crop; 29% corn; 10% oats 30" high in dough stage; 3% row grain sorghum 8" high; 3% Bermuda grass and weed pasture, grass and weeds 10" high, good cover; cropland terraced, contour tilled.                                          |                   |                 |               |                       |               | :24                                | .166         | 1.273         |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | 11:16                              | .0888        | 1.389         |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | :39                                | .0407        | 1.413         |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | :51                                | .0253        | 1.419         |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | 12:14p                             | .0134        | 1.426         |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | :46                                | .0068        | 1.431         |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | 3:12                               | .0016        | 1.441         |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | 5:43                               | .0003        | 1.442         |
| Event of June 4, 1957                                                                                                                                                                                                                                                                        |                   |                 |               |                       |               |                                    |              |               |
| 5-4-57                                                                                                                                                                                                                                                                                       | 0                 | 0.001           | 6-4-57        | Raingage              | 89            | 6-4-57                             |              |               |
| 5-8                                                                                                                                                                                                                                                                                          | .04               | 0               | 3:51p         | 0                     | 0             | 3:58p                              | 0            | 0             |
| 5-9                                                                                                                                                                                                                                                                                          | .97               | .251            | :55           | 1.05                  | .07           | 4:10                               | .0007        | T             |
| 5-10                                                                                                                                                                                                                                                                                         | 0                 | .002            | :58           | 4.60                  | .30           | :12                                | .0032        | T             |
| 5-11                                                                                                                                                                                                                                                                                         | 3.83              | 3.096           | 4:00          | 4.20                  | .44           | :15                                | .0196        | T             |
| 5-12                                                                                                                                                                                                                                                                                         | 0                 | .039            | :05           | 6.00                  | .94           | :17                                | .352         | .007          |
| 5-13                                                                                                                                                                                                                                                                                         | 1.67              | 1.444           | :17           | 1.80                  | 1.30          | :20                                | .744         | .034          |
| 5-14                                                                                                                                                                                                                                                                                         | 0                 | .001            | :21           | 2.55                  | 1.47          | :22                                | 1.03         | .064          |
| 5-15                                                                                                                                                                                                                                                                                         | 0                 | T               | :25           | 1.95                  | 1.60          | :25                                | 1.23         | .121          |
| 5-16                                                                                                                                                                                                                                                                                         | .05               | 0               | :30           | .72                   | 1.66          | :30                                | 1.36         | .230          |
| 5-18                                                                                                                                                                                                                                                                                         | .03               | 0               | :47           | .08                   | 1.68          | :31                                | 1.37         | .252          |
| 5-23                                                                                                                                                                                                                                                                                         | .15               | 0               | Raingage      | W-2A                  | 1.15          | :32                                | 1.36         | .275          |
| 5-25                                                                                                                                                                                                                                                                                         | .02               | 0               | Weighted      | Average <sup>2/</sup> | 1.62          | :36                                | 1.28         | .363          |
| 5-26                                                                                                                                                                                                                                                                                         | .10               | 0               |               |                       |               | :41                                | 1.11         | .463          |
| 6-1                                                                                                                                                                                                                                                                                          | 1.08              | 0               |               |                       |               | :47                                | .836         | .560          |
| 6-3 <sup>3/</sup>                                                                                                                                                                                                                                                                            | .46               | 0               |               |                       |               | :55                                | .531         | .649          |
| 6-4 <sup>3/</sup>                                                                                                                                                                                                                                                                            | .06               | 0               |               |                       |               | 5:00                               | .417         | .688          |
| Watershed Conditions: 50% of area in cotton planted last of May (no crop growing); 29% corn cultivated mid-May; 10% oats stubble, oats harvested; 3% row grain sorghum 20" high; 8% Bermuda grass and weed pasture, grass and weeds 12" high, good cover; cropland terraced, contour tilled. |                   |                 |               |                       |               | :10                                | .247         | .743          |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | :37                                | .0888        | .809          |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | 6:04                               | .0407        | .836          |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | :27                                | .0196        | .847          |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | 7:35                               | .0087        | .861          |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | 9:07                               | .0040        | .872          |
|                                                                                                                                                                                                                                                                                              |                   |                 |               |                       |               | 12:00m                             | .0029        | .880          |
| Notes: To convert runoff in in/hr to cfs, multiply by 40.32. <sup>1/</sup> Runoff prior to 8:20a. <sup>2/</sup> Thiessen method. <sup>3/</sup> Rainfall prior to 3:51p.                                                                                                                      |                   |                 |               |                       |               |                                    |              |               |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                      |                      |                    | Riesel (Waco), Texas |                      |                  | Watershed Y-7    |                 |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                       |                      |                    | Rainfall             |                      |                  | Runoff           |                 |                  |
| Date                                                                                                                                                                                                                                                        | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                  |                      |                    |                      |                      |                  |                  |                 |                  |
| 5-23-59                                                                                                                                                                                                                                                     | 0.18                 | 0.167              | 6-23-59              | Raingage             | .89              | 6-23-59          |                 | 0                |
| 5-24                                                                                                                                                                                                                                                        | .04                  | .005               | 8:46p                |                      |                  | 8:41p            |                 | 0                |
| 5-25                                                                                                                                                                                                                                                        | .01                  | T                  | :49                  | 4.00                 | .20              | :49              | .0011           | T                |
| 6-2                                                                                                                                                                                                                                                         | .21                  | 0                  | :53                  | 3.00                 | .40              | :51              | .0087           | T                |
| 6-3                                                                                                                                                                                                                                                         | .02                  | 0                  | :54                  | 1.80                 | .49              | :57              | .0196           | .002             |
| 6-4                                                                                                                                                                                                                                                         | 1.44                 | .245               | :59                  | 2.00                 | .59              | :59              | .0322           | .002             |
| 6-5                                                                                                                                                                                                                                                         | .60                  | .156               | :05                  | 3.00                 | .89              | 10:02            | .0888           | .005             |
| 6-6                                                                                                                                                                                                                                                         | 0                    | .012               | :43                  | .09                  | .95              | :00              | .166            | .14              |
| 6-12                                                                                                                                                                                                                                                        | .20                  | 0                  | :44                  | 2.40                 | 1.07             | :12              | .265            | .034             |
| 6-20                                                                                                                                                                                                                                                        | .73                  | 0                  | :50                  | 1.80                 | 1.19             | :15              | .553            | .054             |
| 6-22                                                                                                                                                                                                                                                        | .36                  | 0                  | :53                  | 3.80                 | 1.38             | :18              | .699            | .085             |
| Watershed Conditions: 56% of area in cotton, good stand 15" high beginning to bloom; 27% corn in dough stage; 9% oats stubble, oats harvested; 8% Bermuda grass and weeds pasture, weeds and grass 10" high, good cover; cropland terraced, contour tilled. |                      |                    | :56                  | 1.20                 | 1.44             | :20              | .781            | .110             |
|                                                                                                                                                                                                                                                             |                      |                    | :58                  | 4.20                 | 1.58             | :24              | 1.04            | .17              |
|                                                                                                                                                                                                                                                             |                      |                    | 10:05                | .86                  | 1.68             | :27              | 1.25            | .228             |
|                                                                                                                                                                                                                                                             |                      |                    | :13                  |                      | 1.80             | :29              | 1.46            | .273             |
|                                                                                                                                                                                                                                                             |                      |                    | :16                  | 3.60                 | 1.98             | :33              | 1.68            | .378             |
|                                                                                                                                                                                                                                                             |                      |                    | :20                  | 3.00                 | 2.18             | :38              | 1.77            | .521             |
|                                                                                                                                                                                                                                                             |                      |                    | :22                  | 2.70                 | 2.27             | :44              | 1.65            | .692             |
|                                                                                                                                                                                                                                                             |                      |                    | :28                  | 2.00                 | 2.47             | :48              | 1.44            | .794             |
|                                                                                                                                                                                                                                                             |                      |                    | :30                  | 3.00                 | 2.57             | :54              | 1.13            | .923             |
|                                                                                                                                                                                                                                                             |                      |                    | :33                  | 2.00                 | 2.67             | :59              | .855            | 1.004            |
|                                                                                                                                                                                                                                                             |                      |                    | :38                  | 1.20                 | 2.77             | 11:05            | .610            | 1.077            |
|                                                                                                                                                                                                                                                             |                      |                    | :41                  | 1.00                 | 2.82             | :12              | .404            | 1.134            |
|                                                                                                                                                                                                                                                             |                      |                    | Raingage             | W-2A                 | 2.84             | :16              | .340            | 1.150            |
|                                                                                                                                                                                                                                                             |                      |                    | Weighted             | Average              | 2.82             | :24              | .218            | 1.196            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | :30              | .167            | 1.215            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | :40              | .127            | 1.240            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | :50              | .111            | 1.260            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | 12:00m           | .0868           | 1.276            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | 6-24-59          |                 |                  |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | 12:09a           | .0707           | 1.288            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | :20              | .0555           | 1.299            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | 1:05             | .0214           | 1.327            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | :59              | .0108           | 1.340            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | 3:19             | .0052           | 1.350            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | 6:01             | .0021           | 1.359            |
|                                                                                                                                                                                                                                                             |                      |                    |                      |                      |                  | 11:17            | .0005           | 1.366            |
| Notes: To convert runoff in in/hr to cfs, multiply by 4.72. 1/ Thiessen method.                                                                                                                                                                             |                      |                    |                      |                      |                  |                  |                 |                  |



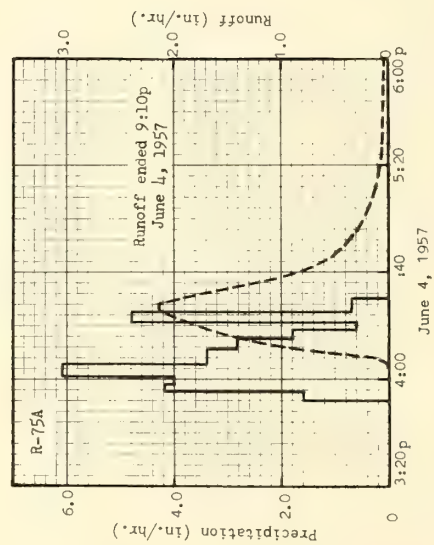
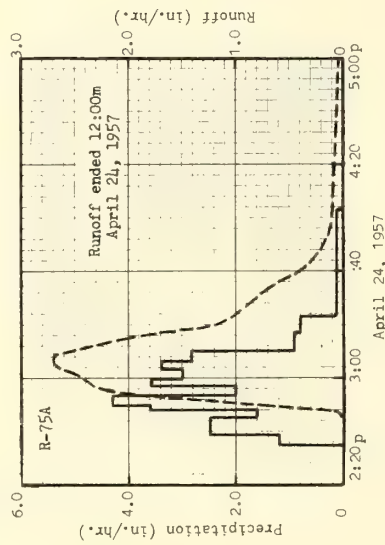
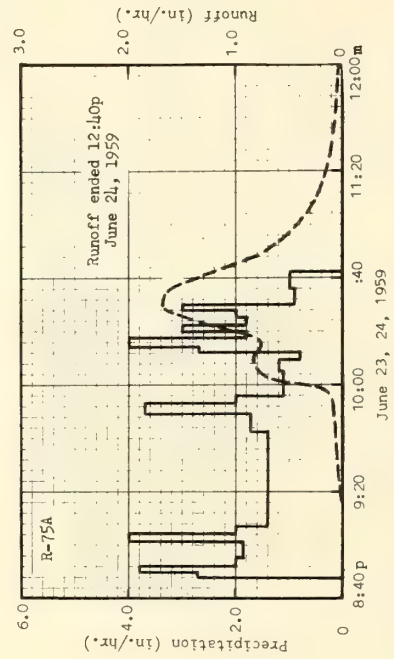
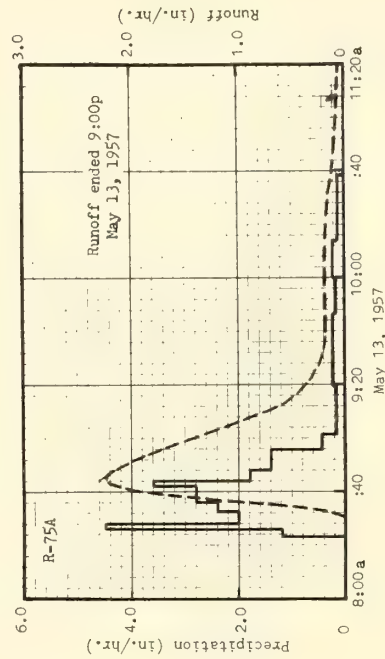
RIESEL (WACO), TEXAS Watershed Y-7

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                        |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas |             |              |             |             |               | Watershed Y-8<br>(Area - 20.8 acres) |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|--------------|----------------------|-------------|--------------|-------------|-------------|---------------|--------------------------------------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                    | Jan.              | Feb.            | Mar.                                      | Apr.              | May           | June          | July         | Aug.                 | Sept.       | Oct.         | Nov.        | Dec.        | Year          |                                      |        |      |
| 1957<br>P<br>Q                                                                                                                                                                                                                                                   | 2.15<br>0         | 2.45<br>0       | 0.40<br>0                                 | 0.64<br>0         | 4.41<br>.05   | 1.93<br>0     | 1.99<br>0    | 2.54<br>0            | 0<br>0      | 0.37<br>0    | 4.53<br>.01 | 1.22<br>0   | 23.43<br>.06  |                                      |        |      |
| 1958<br>P<br>Q                                                                                                                                                                                                                                                   | 1.53<br>0         | 3.09<br>.01     | 5.49<br>.33                               | 14.66<br>9.92     | 8.36<br>5.80  | 5.13<br>1.10  | .01<br>0     | 1.17<br>0            | 4.08<br>0   | 8.12<br>1.63 | 4.50<br>.46 | .88<br>0    | 21.22<br>1.72 |                                      |        |      |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                   | 1.74<br>.05       | 3.40<br>1.14    | 1.37<br>.03                               | 3.27<br>T         | 1.99<br>.29   | 2.33<br>0     | 1.01<br>0    | 6.21<br>.03          | 4.66<br>.16 | 2.81<br>.02  | 1.32<br>0   | 1.35<br>0   | 31.46<br>1.72 |                                      |        |      |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                   | .37<br>0          | 3.30<br>.22     | 1.00<br>T                                 | 3.97<br>.35       | 3.78<br>.31   | 6.89<br>1.70  | 4.32<br>.04  | 3.08<br>0            | 1.91<br>0   | 6.86<br>1.17 | 1.91<br>.70 | 1.44<br>.35 | 1.13<br>4.13  |                                      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                          |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas |             |              |             |             |               | Watershed Y-8                        |        |      |
| YEAR                                                                                                                                                                                                                                                             | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |              |                      |             |              |             |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours      |                      | 12 hours    |              | 1 day       |             | 2 days        |                                      | 8 days |      |
|                                                                                                                                                                                                                                                                  | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date         | Vol.                 | Date        | Vol.         | Date        | Vol.        | Date          | Vol.                                 | Date   | Vol. |
| 1957                                                                                                                                                                                                                                                             | 4-19              | 3.23            | 4-19                                      | 2.41              | 4-19          | 2.80          | 4-23         | 3.32                 | 4-23        | 3.37         | 4-23        | 3.37        | 4-23          | 4.95                                 | 4-19   | 9.10 |
| 1958                                                                                                                                                                                                                                                             | 2-23              | .11             | 2-23                                      | .12               | 2-23          | .22           | 2-22         | .43                  | 2-22        | .67          | 2-22        | 1.02        | 2-22          | 1.11                                 | 2-21   | 1.13 |
| 1959                                                                                                                                                                                                                                                             | 6-23              | 1.1             | 6-23                                      | 1.05              | 6-23          | 1.20          | 6-23         | 1.28                 | 6-23        | 1.28         | 6-23        | 1.28        | 6-23          | 1.36                                 | 6-23   | 1.37 |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volumes, excellent. Watershed conditions: cultivated land use changed to single crop by year as follows: cotton - 1956 and 1959, grain sorghum - 1957, oats and clover - 1958. |                   |                 |                                           |                   |               |               |              |                      |             |              |             |             |               |                                      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas |             |              |             |             |               | Watershed Y-8                        |        |      |
| Antecedent conditions                                                                                                                                                                                                                                            |                   |                 | Rainfall                                  |                   |               | Runoff        |              |                      |             |              |             |             |               |                                      |        |      |
| Date                                                                                                                                                                                                                                                             | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches)        |             |              |             |             |               |                                      |        |      |
| Event of April 24, 1957                                                                                                                                                                                                                                          |                   |                 |                                           |                   |               |               |              |                      |             |              |             |             |               |                                      |        |      |
| 3-27-57                                                                                                                                                                                                                                                          | 0.92              | 0.012           | 4-24-57                                   | Raingage          | 75A           | 4-24-57       |              |                      |             |              |             |             |               |                                      |        |      |
| 3-28                                                                                                                                                                                                                                                             | 0                 |                 | 2:35p                                     | 0                 | 0             | 2:38p         | 0.0008       | 0                    |             |              |             |             |               |                                      |        |      |
| 3-31                                                                                                                                                                                                                                                             | 1.30              | .143            | :39                                       | 1.20              | .04           | :47           | .0048        | T                    |             |              |             |             |               |                                      |        |      |
| 4-1                                                                                                                                                                                                                                                              |                   | .028            | :45                                       | 2.50              | .29           | :48           | .0725        | .001                 |             |              |             |             |               |                                      |        |      |
| 4-3                                                                                                                                                                                                                                                              | .27               | 0               | :48                                       | 1.60              | .37           | :5            | .877         | .116                 |             |              |             |             |               |                                      |        |      |
| 4-4                                                                                                                                                                                                                                                              | .03               | 0               | :50                                       | 1.4               | .49           | :54           | 1.41         | .059                 |             |              |             |             |               |                                      |        |      |
| 4-8                                                                                                                                                                                                                                                              | .03               |                 | :54                                       | 1.35              | .78           | :57           | 2.02         | .114                 |             |              |             |             |               |                                      |        |      |
| 4-13                                                                                                                                                                                                                                                             | .05               | 0               | :57                                       | 2.00              | 1.06          | :57           | 2.34         | .224                 |             |              |             |             |               |                                      |        |      |
| 4-15                                                                                                                                                                                                                                                             | .03               |                 | 3:00                                      | 3.60              | 1.06          | 3:02          | 2.54         | .426                 |             |              |             |             |               |                                      |        |      |
| 4-19                                                                                                                                                                                                                                                             | 4.92              | 2.836           | :03                                       | 3.00              | 1.21          | :05           | 2.71         | .557                 |             |              |             |             |               |                                      |        |      |
| 4-20                                                                                                                                                                                                                                                             | .28               | .228            | :06                                       | 3.40              | 1.38          | :08           | 2.71         | .692                 |             |              |             |             |               |                                      |        |      |
| 4-21                                                                                                                                                                                                                                                             | .20               | .005            | :10                                       | 2.85              | 1.57          | :11           | 2.46         | .822                 |             |              |             |             |               |                                      |        |      |
| 4-22                                                                                                                                                                                                                                                             | .32               | .052            | :17                                       | .94               | 1.68          | :15           | 2.06         | .972                 |             |              |             |             |               |                                      |        |      |
| 4-23                                                                                                                                                                                                                                                             | 3.83              | 3.372           | :23                                       | .67               | 1.76          | :18           | 1.64         | 1.064                |             |              |             |             |               |                                      |        |      |
| 4-24                                                                                                                                                                                                                                                             | .02               | .004            | 4:03                                      | .12               | 1.84          | :23           | 1.27         | 1.183                |             |              |             |             |               |                                      |        |      |
| Watershed Conditions: 95% of area in row grain sorghum planted 4-11, 2" high, fair stand; 4% in sodded waterway; 1% gravel roads; cropland terraced, contour tilled.                                                                                             |                   |                 |                                           |                   |               |               |              |                      | :30         | .825         | 1.302       |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                      | :4          | .400         | 1.396       |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                      | :48         | .235         | 1.437       |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                      | 4:07        | .107         | 1.486       |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                      | :27         | .0529        | 1.511       |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                      | :53         | .0313        | 1.529       |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                      | 5:28        | .0166        | 1.542       |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                      | 6:53        | .0056        | 1.555       |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                      | 9:00        | .0027        | 1.564       |             |               |                                      |        |      |
|                                                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               |               |              |                      | 12:00m      | .013         | 1.569       |             |               |                                      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 2.47. 1/ Prior to event beginning 2:35p. For rap of watershed, see page 42.11-5.                                                                                                                           |                   |                 |                                           |                   |               |               |              |                      |             |              |             |             |               |                                      |        |      |



| SELECTED RUNOFF EVENTS                                                                                                                                   |                   |                 |               |                   |               | Riesel (Waco), Texas Watershed Y-8 |              |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-------------------|---------------|------------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                    |                   |                 | Rainfall      |                   |               | Runoff                             |              |               |
| Date                                                                                                                                                     | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                      | Rate (in/hr) | Acc. (inches) |
| Event of May 13, 1957                                                                                                                                    |                   |                 |               |                   |               |                                    |              |               |
| 4-13-57                                                                                                                                                  | 0.05              | 0               | 5-13-57       | Raingage          | 75A           | 5-13-57                            |              |               |
| 4-15                                                                                                                                                     | .03               | 0               | 8:23a         | 0                 | 0             | 8:20a                              | T            | 0             |
| 4-19                                                                                                                                                     | 4.92              | 2.836           | :26           | 1.20              | .06           | :30                                | .0115        | T             |
| 4-20                                                                                                                                                     | .28               | .228            | :28           | 4.50              | .21           | :32                                | .121         | .002          |
| 4-21                                                                                                                                                     | .20               | .005            | :33           | 2.04              | .38           | :34                                | .419         | .011          |
| 4-22                                                                                                                                                     | .32               | .052            | :37           | 2.40              | .54           | :36                                | .944         | .034          |
| 4-23                                                                                                                                                     | 3.83              | 3.372           | :42           | 2.88              | .78           | :38                                | 1.31         | .071          |
| 4-24                                                                                                                                                     | 1.86              | 1.574           | :44           | 3.60              | .90           | :40                                | 1.84         | .124          |
| 4-25                                                                                                                                                     | 0                 | .010            | :48           | 1.80              | 1.02          | :42                                | 2.15         | .191          |
| 4-26                                                                                                                                                     | 1.26              | .711            | :56           | 1.42              | 1.21          | :44                                | 2.23         | .264          |
| 4-27                                                                                                                                                     | .28               | .312            | 9:01          | .48               | 1.25          | :49                                | 2.13         | .447          |
| 4-28                                                                                                                                                     | 1.23              | .769            | :20           | .19               | 1.31          | :52                                | 2.02         | .551          |
| 4-29                                                                                                                                                     | .04               | .027            | :35           | .24               | 1.37          | :56                                | 1.73         | .676          |
| 4-30                                                                                                                                                     | .03               | .002            | :47           | .20               | 1.41          | 9:00                               | 1.56         | .785          |
| 5-1                                                                                                                                                      | .24               | .046            | 10:00         | .18               | 1.45          | :04                                | 1.25         | .880          |
| 5-2                                                                                                                                                      | 0                 | .003            | :14           | .21               | 1.50          | :06                                | 1.05         | .918          |
| 5-3                                                                                                                                                      | 1.41              | 1.050           | :39           | .14               | 1.56          | :08                                | .906         | .951          |
| 5-4                                                                                                                                                      | 0                 | .003            |               |                   |               | :12                                | .625         | 1.002         |
| 5-8                                                                                                                                                      | .02               | 0               |               |                   |               | :19                                | .369         | 1.058         |
| 5-9                                                                                                                                                      | 1.01              | .275            |               |                   |               | :22                                | .369         | 1.076         |
| 5-10                                                                                                                                                     | 0                 | T               |               |                   |               | :29                                | .235         | 1.110         |
| 5-11                                                                                                                                                     | 3.74              | 2.999           |               |                   |               | :40                                | .180         | 1.147         |
| 5-12                                                                                                                                                     | 0                 | .033            |               |                   |               | 10:10                              | .180         | 1.237         |
| 5-13                                                                                                                                                     | .04               | T               |               |                   |               | :25                                | .162         | 1.279         |
|                                                                                                                                                          |                   |                 |               |                   |               | :38                                | .136         | 1.312         |
| Watershed Conditions: 95% of area in row grain sorghum, 8" high; 4% sodded waterway; 1% gravel roads; cropland terraced, contour tilled.                 |                   |                 |               |                   |               | :50                                | .107         | 1.336         |
|                                                                                                                                                          |                   |                 |               |                   |               | 11:01                              | .0668        | 1.352         |
|                                                                                                                                                          |                   |                 |               |                   |               | :20                                | .0313        | 1.367         |
|                                                                                                                                                          |                   |                 |               |                   |               | :39                                | .0166        | 1.374         |
|                                                                                                                                                          |                   |                 |               |                   |               | 12:00n                             | .0101        | 1.379         |
|                                                                                                                                                          |                   |                 |               |                   |               | :30p                               | .0056        | 1.382         |
|                                                                                                                                                          |                   |                 |               |                   |               | 1:45                               | .0027        | 1.387         |
| Event of June 4, 1957                                                                                                                                    |                   |                 |               |                   |               | 3:40                               | .0010        | 1.391         |
|                                                                                                                                                          |                   |                 |               |                   |               | 9:00                               | .0001        | 1.393         |
| Event of June 4, 1957                                                                                                                                    |                   |                 |               |                   |               |                                    |              |               |
| 5-8-57                                                                                                                                                   | 0.02              | 0               | 6-4-57        | Raingage          | 75A           | 6-4-57                             |              |               |
| 5-9                                                                                                                                                      | 1.01              | .275            | 3:52p         | 0                 | 0             | 3:52p                              | T            | 0             |
| 5-10                                                                                                                                                     | 0                 | T               | :55           | 1.60              | .08           | 4:04                               | .0056        | T             |
| 5-11                                                                                                                                                     | 3.74              | 2.999           | :58           | 4.20              | .29           | :07                                | .0572        | .002          |
| 5-12                                                                                                                                                     | 0                 | .033            | 4:01          | 4.05              | .56           | :08                                | .136         | .003          |
| 5-13                                                                                                                                                     | 1.62              | 1.393           | :05           | 6.15              | .97           | :10                                | .432         | .012          |
| 5-14, 15                                                                                                                                                 | 0                 | .001            | :11           | 3.40              | 1.31          | :12                                | .877         | .033          |
| 5-16                                                                                                                                                     | .05               | 0               | :15           | 2.85              | 1.50          | :14                                | 1.23         | .068          |
| 5-18                                                                                                                                                     | .04               | 0               | :18           | 1.80              | 1.59          | :18                                | 1.61         | .165          |
| 5-23                                                                                                                                                     | .13               | 0               | :21           | .60               | 1.62          | :22                                | 1.93         | .282          |
| 5-25                                                                                                                                                     | .02               | 0               | :25           | 4.80              | 1.94          | :26                                | 2.15         | .418          |
| 5-26                                                                                                                                                     | .08               | 0               | :30           | .72               | 2.00          | :28                                | 2.15         | .490          |
| 6-1                                                                                                                                                      | .98               | T               |               |                   |               | :30                                | 2.02         | .559          |
| 6-2                                                                                                                                                      | 0                 | T               |               |                   |               | :32                                | 1.80         | .623          |
| 6-3                                                                                                                                                      | .44               | .001            |               |                   |               | :35                                | 1.46         | .704          |
| 6-4                                                                                                                                                      | .19 2/            | T 3/            |               |                   |               | :38                                | 1.06         | .767          |
| Watershed Conditions: 95% of area in row grain sorghum, 24" high, good cover; 4% in sodded waterway; 1% gravel roads; cropland terraced, contour tilled. |                   |                 |               |                   |               | :42                                | .701         | .825          |
|                                                                                                                                                          |                   |                 |               |                   |               | :47                                | .496         | .874          |
|                                                                                                                                                          |                   |                 |               |                   |               | :55                                | .288         | .925          |
|                                                                                                                                                          |                   |                 |               |                   |               | 5:07                               | .153         | .966          |
|                                                                                                                                                          |                   |                 |               |                   |               | :19                                | .095         | .991          |
|                                                                                                                                                          |                   |                 |               |                   |               | :43                                | .045         | 1.017         |
|                                                                                                                                                          |                   |                 |               |                   |               | 6:12                               | .023         | 1.032         |
|                                                                                                                                                          |                   |                 |               |                   |               | 7:10                               | .012         | 1.048         |
|                                                                                                                                                          |                   |                 |               |                   |               | 9:10                               | .006         | 1.067         |
| Notes: To convert runoff in in/hr to cfs, multiply by 20.97. 1/ Prior to event beginning 8:23a. 2/ Rain ended 11:30a. 3/ Runoff prior to 3:52p.          |                   |                 |               |                   |               |                                    |              |               |

| SELECTED RUNOFF EVENTS                                                                                                                                                        |                      |                    | Riesel (Waco), Texas |                      |                  | Watershed Y-8    |                 |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                         |                      |                    | Rainfall             |                      |                  | Runoff           |                 |                  |
| Date                                                                                                                                                                          | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 23, 24, 1959                                                                                                                                                    |                      |                    |                      |                      |                  |                  |                 |                  |
| 5-23-59                                                                                                                                                                       | 0.16                 | 0.121              | 6-23-59              | Raingage             | .75A             | 6-23-59          |                 |                  |
| 5-24                                                                                                                                                                          | .06                  | .001               | 8:47p                | 0                    | 0                | 9:15p            | 0               | 0                |
| 5-25                                                                                                                                                                          | T                    | 0                  | :49                  | 2.70                 | .09              | :17              | .0257           | T                |
| 6-2                                                                                                                                                                           | .18                  | 0                  | :52                  | 3.80                 | .28              | :28              | .0529           | .009             |
| 6-3                                                                                                                                                                           | .02                  | 0                  | :55                  | 2.00                 | .38              | :36              | .0782           | .018             |
| 6-4                                                                                                                                                                           | 1.46                 | .191               | 9:01                 | 1.90                 | .57              | :54              | .101            | .039             |
| 6-5                                                                                                                                                                           | .58                  | .128               | :04                  | 4.00                 | .77              | :58              | .144            | .049             |
| 6-6                                                                                                                                                                           | 0                    | .004               | :11                  | 2.00                 | .87              | 10:00            | .304            | .056             |
| 6-12                                                                                                                                                                          | .16                  | 0                  | :42                  | 1.40                 | .89              | :02              | .682            | .073             |
| 6-20                                                                                                                                                                          | .69                  | 0                  | :49                  | 1.72                 | 1.09             | :08              | .877            | .156             |
| 6-22                                                                                                                                                                          | .35                  | 0                  | :53                  | 3.75                 | 1.34             | :12              | .811            | .212             |
| 6-23                                                                                                                                                                          | .10 1/2              | 0                  | :56                  | 2.00                 | 1.44             | :15              | .768            | .251             |
| Watershed Conditions: 95% of<br>area in cotton, good stand, 16"<br>high, beginning to bloom; 4% in<br>sodded waterway; 1% gravel roads;<br>cropland terraced, contour tilled. |                      |                    | 10:05                | 1.14                 | 1.61             | :18              | .877            | .292             |
|                                                                                                                                                                               |                      |                    | :09                  | 1.20                 | 1.69             | :20              | 1.05            | .324             |
|                                                                                                                                                                               |                      |                    | :12                  | .80                  | 1.73             | :23              | 1.35            | .385             |
|                                                                                                                                                                               |                      |                    | :14                  | 2.70                 | 1.83             | :26              | 1.68            | .536             |
|                                                                                                                                                                               |                      |                    | :17                  | 4.00                 | 2.02             | :37              | 1.59            | .762             |
|                                                                                                                                                                               |                      |                    | :20                  | 1.80                 | 2.11             | :42              | 1.28            | .880             |
|                                                                                                                                                                               |                      |                    | :22                  | 3.00                 | 2.21             | :48              | .877            | .986             |
|                                                                                                                                                                               |                      |                    | :25                  | 1.80                 | 2.30             | :52              | .682            | 1.039            |
|                                                                                                                                                                               |                      |                    | :28                  | 2.00                 | 2.40             | :58              | .438            | 1.093            |
|                                                                                                                                                                               |                      |                    | :30                  | 3.00                 | 2.50             | 11:04            | .339            | 1.132            |
|                                                                                                                                                                               |                      |                    | :36                  | .90                  | 2.59             | :12              | .230            | 1.169            |
|                                                                                                                                                                               |                      |                    | :42                  | 1.00                 | 2.69             | :26              | .121            | 1.208            |
|                                                                                                                                                                               |                      |                    |                      |                      |                  | :39              | .0725           | 1.229            |
|                                                                                                                                                                               |                      |                    |                      |                      |                  | 12:00m           | .0377           | 1.248            |
|                                                                                                                                                                               |                      |                    |                      |                      |                  | 6-24-59          |                 |                  |
|                                                                                                                                                                               |                      |                    |                      |                      |                  | :21a             | .0208           | 1.258            |
|                                                                                                                                                                               |                      |                    |                      |                      |                  | :56              | .0101           | 1.265            |
|                                                                                                                                                                               |                      |                    |                      |                      |                  | 1:45             | .0040           | 1.271            |
|                                                                                                                                                                               |                      |                    |                      |                      |                  | 2:56             | .0017           | 1.274            |
|                                                                                                                                                                               |                      |                    |                      |                      |                  | 12:4.p           | 0               | 1.278            |
| Notes: To convert runoff in in/hr to cfs, multiply by 20.97. 1/ Rainfall prior to 8:47p.                                                                                      |                      |                    |                      |                      |                  |                  |                 |                  |



RIESEL (WACO), TEXAS Watershed Y-8

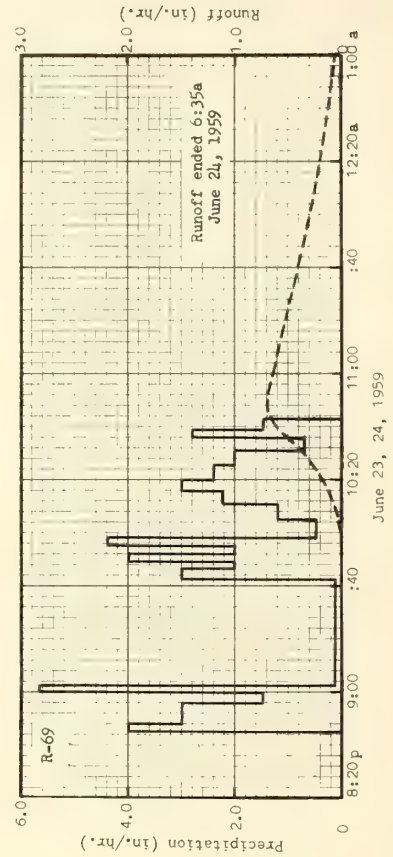
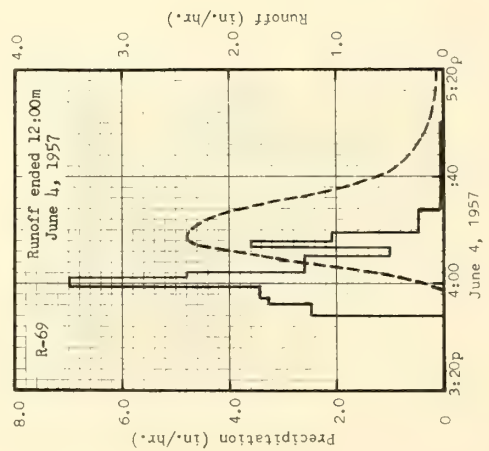
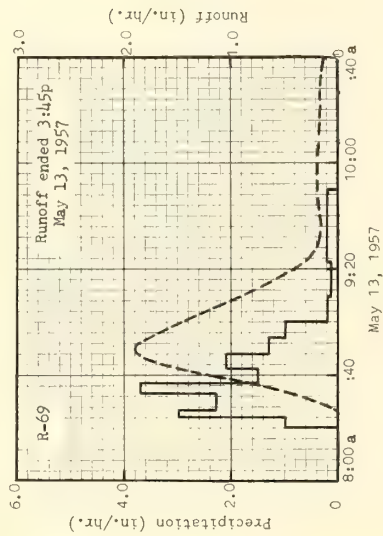
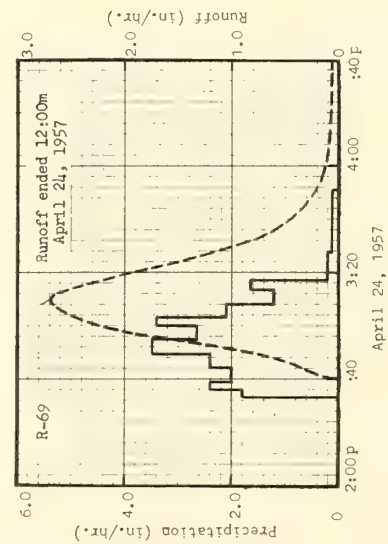
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                                                              |                   |      |                                           |               |                   |                       |               | Riesel (Waco), Texas Watershed Y-10<br>(Area - 18.6 acres) |               |       |       |       |        |       |        |       |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|---------------|-------------------|-----------------------|---------------|------------------------------------------------------------|---------------|-------|-------|-------|--------|-------|--------|-------|--|
| Year                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Month             | Jan. | Feb.                                      | Mar.          | Apr.              | May                   | June          | July                                                       | Aug.          | Sept. | Oct.  | Nov.  | Dec.   | Year  |        |       |  |
| 1956                                                                                                                                                                                                                                                                                                                                                                                                                                                   | P                 | 2.31 | 2.34                                      | 0.34          | 0.58              | 4.61                  | 1.94          | 1.64                                                       | 2.54          | 0     | 0.42  | 4.48  | 1.93   | 23.13 |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Q                 | 0    | 0                                         | 0             |                   |                       |               |                                                            | 0             | 0     | 0     | .16   | 0      | .16   |        |       |  |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                   | P                 | 1.57 | 3.24                                      | 5.63          | 15.57             | 8.47                  | 4.29          | 1                                                          | 1.20          | 4.17  | 8.48  | 4.76  | .85    | 58.23 |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Q                 |      | .01                                       | .60           | 11.59             | 6.05                  | 1.30          | 0                                                          | 0             | 0     | 2.17  | 1.06  | 0      | 22.78 |        |       |  |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                   | P                 | 1.79 | 3.51                                      | 1.41          | 3.28              | 1.84                  | 2.54          | .98                                                        | 6.58          | 5.30  | 3.12  | 1.37  | 1.42   | 33.14 |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Q                 | .01  | 1.01                                      | 1             | .01               | .83                   | 0             |                                                            | .27           | .65   | .38   | 0     | 1      | 3.16  |        |       |  |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                   | P                 | .38  | 1.44                                      | .91           | 4.02              | 3.98                  | 7.27          | 4.48                                                       | 3.34          | 1.88  | 6.81  | 2.07  | 3.59   | 42.06 |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Q                 |      | .49                                       | 1             | .02               | 1                     | 1.15          | .06                                                        | 1             | 0     | 1.70  | .57   | .46    | 4.45  |        |       |  |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                                                                |                   |      |                                           |               |                   |                       |               | Riesel (Waco), Texas Watershed Y-10                        |               |       |       |       |        |       |        |       |  |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                                                                   | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      | 1 hour                                    |               | 2 hours           |                       | 6 hours       |                                                            | 12 hours      |       | 1 day |       | 2 days |       | 8 days |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Date              | Rate | Date                                      | Vol.          | Date              | Vol.                  | Date          | Vol.                                                       | Date          | Vol.  | Date  | Vol.  | Date   | Vol.  | Date   | Vol.  |  |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4-19              | 3.73 | 4-19                                      | 2.90          | 4-19              | 3.48                  | 4-19          | 3.62                                                       | 4-19          | 3.86  | 4-19  | 3.91  | 4-23   | 5.34  | 4-19   | 10.57 |  |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5-3               | .32  | 5-3                                       | .23           | 5-3               | .37                   | 5-2           | .57                                                        | 5-2           | .75   | 2-22  | .91   | 2-22   | .99   | 2-21   | 1.01  |  |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 6-23              | .70  | 6-23                                      | .59           | 6-23              | .93                   | 6-23          | 1.11                                                       | 10-4          | 1.45  | 10-4  | 1.61  | 10-4   | 1.65  | 10-4   | 1.65  |  |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volumes, excellent. Watershed conditions: area changed to 18.6 acres Jan., 1956. Cultivated land use changed to single crop by year as follows: oats and corn - 1956 and 1957, cotton - 1958, grain sorghum - 1959. See page 42.17-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, S.W. June 1957 (reprinted 1961). |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           |               |                   |                       |               | Riesel (Waco), Texas Watershed Y-10                        |               |       |       |       |        |       |        |       |  |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |      |                                           | Rainfall      |                   |                       |               | Runoff                                                     |               |       |       |       |        |       |        |       |  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Rainfall (inches) |      | Runoff (inches)                           | Date and time | Intensity (in/hr) | Acc. (inches)         | Date and time | Rate (in/hr)                                               | Acc. (inches) |       |       |       |        |       |        |       |  |
| Event of April 24, 1957                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
| 3-27-57                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.14              |      | 0.074                                     | 4-24-57       | Raingage          | 6W                    | 4-24-57       |                                                            |               |       |       |       |        |       |        |       |  |
| 3-28                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |      | .002                                      | 2:33p         | 0                 |                       | 2:34p         | 0.0025                                                     |               |       |       | 0     |        |       |        |       |  |
| 3-31                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.33              |      | .390                                      | :36           | 1.80              | .09                   | :40           | .0259                                                      |               |       |       | 1     |        |       |        |       |  |
| 4-1, 2                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |      | .050                                      | :39           | 2.40              | .21                   | :42           | .263                                                       |               |       |       | .006  |        |       |        |       |  |
| 4-3                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .23               |      | .005                                      | :44           | 2.04              | .38                   | :45           | .399                                                       |               |       |       | .022  |        |       |        |       |  |
| 4-4                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .02               |      | 0                                         | :49           | 2.40              | .58                   | :47           | .575                                                       |               |       |       | .038  |        |       |        |       |  |
| 4-8                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .03               |      |                                           | :55           | 3.50              | .93                   | :49           | .821                                                       |               |       |       | .062  |        |       |        |       |  |
| 4-13                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .05               |      | 0                                         | 3:00          | 2.64              | 1.15                  | :51           | 1.07                                                       |               |       |       | .093  |        |       |        |       |  |
| 4-15                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .05               |      | 0                                         | :03           | 3.40              | 1.32                  | :54           | 1.53                                                       |               |       |       | .158  |        |       |        |       |  |
| 4-19                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.64              |      | 3.592                                     | :08           | 2.16              | 1.50                  | :59           | 2.15                                                       |               |       |       | .314  |        |       |        |       |  |
| 4-20                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .31               |      | .322                                      | :13           | 1.20              | 1.60                  | 3:05          | 2.55                                                       |               |       |       | .550  |        |       |        |       |  |
| 4-21                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .20               |      | .029                                      | :17           | 1.65              | 1.71                  | :09           | 2.70                                                       |               |       |       | .724  |        |       |        |       |  |
| 4-22                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .34               |      | .095                                      | :21           | .24               | 1.75                  | :11           | 2.66                                                       |               |       |       | .814  |        |       |        |       |  |
| 4-23                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3.90              |      | 3.584                                     | :51           | .11               | 1.79                  | :16           | 2.29                                                       |               |       |       | .978  |        |       |        |       |  |
| 4-24 <sup>1/</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                     | .04               |      | .015                                      | Raingage      | 75A               | 1.84                  | :20           | 1.92                                                       |               |       |       | 1.162 |        |       |        |       |  |
| Watershed Conditions: 93% bedded for cotton, beds cultivated first week of April; 4% in sodded waterway; 3% in gravel roads; cropland terraced contour tilled.                                                                                                                                                                                                                                                                                         |                   |      |                                           | Weighted      |                   | Average <sup>2/</sup> |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |
| Notes: To convert runoff in in/hr to cfs, multiply by 18.75. <sup>1/</sup> Prior to event beginning 2:33p. <sup>2/</sup> Thiessen method. For map of watershed, see page 42.11-5.                                                                                                                                                                                                                                                                      |                   |      |                                           |               |                   |                       |               |                                                            |               |       |       |       |        |       |        |       |  |



| SELECTED RUNOFF EVENTS                                                                                                                                                                                             |                   |                 |               |                       |               | Riesel (Waco), Texas Watershed Y-10 |              |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-----------------------|---------------|-------------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                              |                   |                 | Rainfall      |                       |               | Runoff                              |              |               |
| Date                                                                                                                                                                                                               | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr)     | Acc. (inches) | Date and time                       | Rate (in/hr) | Acc. (inches) |
| Event of May 13, 1957                                                                                                                                                                                              |                   |                 |               |                       |               |                                     |              |               |
| 4-13-57                                                                                                                                                                                                            | 0.05              | 0               | 5-13-57       | Raingage              | 69            | 5-13-57                             |              |               |
| 4-15                                                                                                                                                                                                               | .05               | 0               | 8:20a         | 0                     | 0             | 8:24a                               | 0            | 0             |
| 4-19                                                                                                                                                                                                               | 5.64              | 3.592           | :24           | 1.05                  | .07           | :27                                 | .0025        | T             |
| 4-20                                                                                                                                                                                                               | .31               | .322            | :26           | 3.00                  | .17           | :29                                 | .135         | .002          |
| 4-21                                                                                                                                                                                                               | .20               | .029            | :33           | 2.32                  | .44           | :32                                 | .338         | .014          |
| 4-22                                                                                                                                                                                                               | .34               | .095            | :37           | 3.75                  | .69           | :36                                 | .682         | .045          |
| 4-23                                                                                                                                                                                                               | 3.90              | 3.584           | :42           | 1.56                  | .82           | :40                                 | 1.29         | .113          |
| 4-24                                                                                                                                                                                                               | 1.85              | 1.747           | :48           | 2.10                  | 1.03          | :44                                 | 1.68         | .214          |
| 4-25                                                                                                                                                                                                               | 0                 | .021            | :54           | 1.30                  | 1.16          | :46                                 | 1.80         | .272          |
| 4-26                                                                                                                                                                                                               | 1.27              | .834            | 9:00          | 1.00                  | 1.26          | :49                                 | 1.91         | .365          |
| 4-27                                                                                                                                                                                                               | .25               | .345            | :10           | .24                   | 1.30          | :50                                 | 1.91         | .397          |
| 4-28                                                                                                                                                                                                               | 1.37              | .923            | :22           | .15                   | 1.33          | :52                                 | 1.88         | .460          |
| 4-29                                                                                                                                                                                                               | .02               | .046            | :50           | .21                   | 1.43          | 9:01                                | 1.48         | .717          |
| 4-30                                                                                                                                                                                                               | .04               | .001            | 10:00         | .48                   | 1.47          | :08                                 | 1.01         | .863          |
| 5-1                                                                                                                                                                                                                | .21               | .024            | :20           | .21                   | 1.54          | :16                                 | .570         | .966          |
| 5-2                                                                                                                                                                                                                | 0                 | .002            | 11:00         | .06                   | 1.58          | :20                                 | .420         | .998          |
| 5-3                                                                                                                                                                                                                | 1.78              | 1.394           | Raingage      | 75A                   | 1.60          | :27                                 | .201         | 1.033         |
| 5-4                                                                                                                                                                                                                | 0                 | .006            | Weighted      | Average <sup>2/</sup> | 1.58          | :40                                 | .196         | 1.071         |
| 5-8                                                                                                                                                                                                                | .04               | 0               |               |                       |               | :55                                 | .201         | 1.121         |
| 5-9                                                                                                                                                                                                                | .95               | .355            |               |                       |               | 10:07                               | .196         | 1.161         |
| 5-10                                                                                                                                                                                                               | 0                 | T               |               |                       |               | :24                                 | .175         | 1.213         |
| 5-11                                                                                                                                                                                                               | 3.61              | 2.910           |               |                       |               | :43                                 | .119         | 1.262         |
| 5-12                                                                                                                                                                                                               | 0                 | .027            |               |                       |               | 11:02                               | .0591        | 1.289         |
| 5-13 <sup>1/</sup>                                                                                                                                                                                                 | .04               | 0               |               |                       |               | :23                                 | .0287        | 1.304         |
| Watershed Conditions: 93% bedded cultivated first week of April; 4% in sodded waterway; 3% in gravel roads; cropland terraced, contour tilled.                                                                     |                   |                 |               |                       |               | :48                                 | .0146        | 1.313         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | 1:10p                               | .0045        | 1.323         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | 3:45                                | .0011        | 1.329         |
| Event of June 4, 1957                                                                                                                                                                                              |                   |                 |               |                       |               |                                     |              |               |
| 5-4-57                                                                                                                                                                                                             | 0                 | 0.006           | 6-4-57        | Raingage              | 69            | 6-4-57                              |              |               |
| 5-8                                                                                                                                                                                                                | .04               | 0               | 3:48p         | 0                     | 0             | 3:51p                               | 0            | 0             |
| 5-9                                                                                                                                                                                                                | .95               | .355            | :52           | 2.55                  | .17           | :57                                 | .0045        | T             |
| 5-10                                                                                                                                                                                                               | 0                 | T               | :54           | 3.30                  | .28           | :58                                 | .0591        | .001          |
| 5-11                                                                                                                                                                                                               | 3.61              | 2.910           | :59           | 3.48                  | .57           | 4:00                                | .212         | .005          |
| 5-12                                                                                                                                                                                                               | 0                 | .027            | 4:02          | 7.00                  | .92           | :04                                 | .586         | .033          |
| 5-13                                                                                                                                                                                                               | 1.62              | 1.331           | :04           | 4.80                  | 1.08          | :06                                 | .980         | .058          |
| 5-14                                                                                                                                                                                                               | 0                 | T               | :10           | 2.60                  | 1.34          | :08                                 | 1.40         | .098          |
| 5-16                                                                                                                                                                                                               | .02               | 0               | :13           | 1.00                  | 1.39          | :12                                 | 2.01         | .213          |
| 5-18                                                                                                                                                                                                               | .02               | 0               | :15           | 3.60                  | 1.51          | :15                                 | 2.38         | .324          |
| 5-23                                                                                                                                                                                                               | .12               | 0               | :19           | 2.10                  | 1.65          | :17                                 | 2.40         | .404          |
| 5-25                                                                                                                                                                                                               | T                 | 0               | :27           | .45                   | 1.71          | :20                                 | 2.36         | .523          |
| 5-26                                                                                                                                                                                                               | .10               | 0               | 5:00          | .02                   | 1.72          | :27                                 | 2.01         | .784          |
| 6-1                                                                                                                                                                                                                | .80               | 0               | Raingage      | 75A                   | 2.02          | :31                                 | 1.50         | .902          |
| 6-3                                                                                                                                                                                                                | .33               | 0               | Weighted      | Average <sup>2/</sup> | 1.74          | :34                                 | 1.17         | .969          |
| 6-4                                                                                                                                                                                                                | .26 <sup>3/</sup> | T <sup>4/</sup> |               |                       |               | :38                                 | .799         | 1.033         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | :44                                 | .385         | 1.091         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | :50                                 | .251         | 1.122         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | :58                                 | .152         | 1.147         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | 5:06                                | .0932        | 1.164         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | :14                                 | .0746        | 1.175         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | :43                                 | .0350        | 1.199         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | 6:40                                | .0146        | 1.221         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | 7:10                                | .0120        | 1.227         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | :30                                 | .0146        | 1.232         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | :50                                 | .0146        | 1.237         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | 9:20                                | .0068        | 1.251         |
|                                                                                                                                                                                                                    |                   |                 |               |                       |               | 12:00 m                             | .0045        | 1.267         |
| Notes: To convert runoff in in/hr to cfs, multiply by 18.75. <sup>1/</sup> Prior to event beginning 8:20a. <sup>2/</sup> Thiessen method. <sup>3/</sup> Rainfall ended 12:00n. <sup>4/</sup> Runoff prior to 3:51p |                   |                 |               |                       |               |                                     |              |               |

| SELECTED RUNOFF EVENTS                                                                                                                                                   |                      |                    | Riesel (Waco), Texas |                       |                  | Watershed Y-10   |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------|-----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                    |                      |                    | Rainfall             |                       |                  | Runoff           |                 |                  |
| Date                                                                                                                                                                     | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time     | Intensity<br>(in/hr)  | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 23, 24, 1955                                                                                                                                               |                      |                    |                      |                       |                  |                  |                 |                  |
| 5-23-59                                                                                                                                                                  | 0.03                 |                    | 6-23-59              | Reingage              | .69              | 6-23-59          |                 |                  |
| 5-25                                                                                                                                                                     | T                    |                    | 8:45p                | 0                     | 0                | 8:39p            |                 |                  |
| 6-2                                                                                                                                                                      | .19                  |                    | 8:48                 | 4.00                  | .20              | 8:50             | .0011           | T                |
| 6-3                                                                                                                                                                      | .02                  |                    | 8:50                 | 3.00                  | .60              | 8:56             | .0063           | T                |
| 6-4                                                                                                                                                                      | 1.45                 |                    | 8:58                 | 1.50                  | .70              | 9:01             | .0165           | .1               |
| 6-5                                                                                                                                                                      | .66                  |                    | 8:59                 | 5.70                  | .89              | 9:04             | .0258           | .002             |
| 6-12                                                                                                                                                                     | .16                  |                    | 9:04                 | 1.50                  | .99              | 9:08             | .0421           | .005             |
| 6-20                                                                                                                                                                     | .74                  |                    | 9:08                 | 3.00                  | 1.19             | 9:12             | .0693           | .008             |
| 6-22                                                                                                                                                                     | .37                  |                    | 9:09                 | 2.00                  | 1.29             | 9:17             | .112            | .016             |
|                                                                                                                                                                          |                      |                    | 9:19                 | 4.00                  | 1.49             | 9:22             | .111            | .028             |
|                                                                                                                                                                          |                      |                    | 9:29                 | 2.00                  | 1.59             | 9:29             | .334            | .06              |
|                                                                                                                                                                          |                      |                    | 9:34                 | 4.40                  | 1.81             | 9:34             | .440            | .092             |
|                                                                                                                                                                          |                      |                    | 9:38                 | .51                   | 1.87             | 9:38             | .554            | .125             |
|                                                                                                                                                                          |                      |                    | 9:44                 | 1.20                  | 1.99             | 9:44             | .693            | .188             |
|                                                                                                                                                                          |                      |                    | 9:48                 | 2.28                  | 2.18             | 9:48             | .703            | .246             |
| Watered conditions: 4% in<br>oats-clover, oats harvested, clover<br>growing, 12" high; 4% in<br>Antecedent: 4% in grass, clover; 4% in<br>land terraced; contour tilled. |                      |                    | 9:55                 | 3.00                  | 2.38             | 9:55             | .682            | .315             |
|                                                                                                                                                                          |                      |                    | 10:00                | 2.40                  | 2.58             | 11:13            | .586            | .506             |
|                                                                                                                                                                          |                      |                    | 10:04                | 2.00                  | 2.78             | 11:25            | .511            | .615             |
|                                                                                                                                                                          |                      |                    | 10:08                | .72                   | 2.84             | 11:38            | .440            | .718             |
|                                                                                                                                                                          |                      |                    | 10:19                | 2.80                  | 2.90             | 11:48            | .385            | .787             |
|                                                                                                                                                                          |                      |                    | 10:43                | 1.50                  | 3.00             | 12:00m           | .315            | .857             |
|                                                                                                                                                                          |                      |                    | Reingage             | 1.50                  | 2.95             | 6-24-59          |                 |                  |
|                                                                                                                                                                          |                      |                    | Weighted             | Average <sup>1/</sup> | 2.97             | 12:07a           | .286            | .892             |
|                                                                                                                                                                          |                      |                    |                      |                       |                  | 12:15            | .251            | .928             |
|                                                                                                                                                                          |                      |                    |                      |                       |                  | 12:45            | .119            | 1.018            |
|                                                                                                                                                                          |                      |                    |                      |                       |                  | 1:00             | .0746           | 1.051            |
|                                                                                                                                                                          |                      |                    |                      |                       |                  | 1:41             | .0350           | 1.081            |
|                                                                                                                                                                          |                      |                    |                      |                       |                  | 2:17             | .0186           | 1.097            |
|                                                                                                                                                                          |                      |                    |                      |                       |                  | 3:05             | .0085           | 1.107            |
|                                                                                                                                                                          |                      |                    |                      |                       |                  | 4:18             | .0030           | 1.114            |
|                                                                                                                                                                          |                      |                    |                      |                       |                  | 4:35             | .0005           | 1.117            |

Notes: To convert runoff in in/hr to cfs, multiply by 1.48. <sup>1/</sup> Thiessen method.



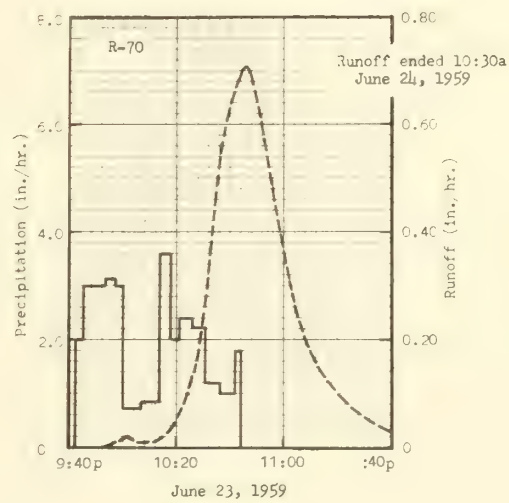
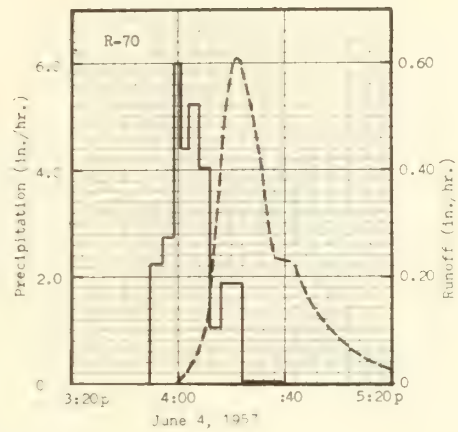
RIESEL (WACO), TEXAS Watershed Y-10

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas Watershed SW-12<br>(Area - 2.27 acres) |             |             |             |             |                |      |        |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|--------------|-------------------------------------------------------------|-------------|-------------|-------------|-------------|----------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                             | Jan.              | Feb.            | Mar.                                      | Apr.              | May           | June          | July         | Aug.                                                        | Sept.       | Oct.        | Nov.        | Dec.        | Year           |      |        |      |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                      | P 2.28<br>C 0     | 2.27<br>0       | 0.36<br>0                                 | 0.62<br>0         | 4.58<br>0     | 2.01<br>0     | 1.77<br>0    | 2.61<br>0                                                   | 0<br>0      | 0.55<br>0   | 4.45<br>0   | 2.06<br>0   | 23.56<br>0     |      |        |      |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                      | P 1.58<br>C 0     | 3.30<br>.01     | 5.67<br>.09                               | 14.90<br>8.95     | 8.54<br>6.60  | 4.52<br>.3    | .02<br>0     | 1.4<br>0                                                    | 4.28<br>0   | 8.43<br>.04 | 4.67<br>.63 | .86<br>0    | 57.81<br>16.62 |      |        |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                      | P 1.88<br>C .10   | 3.35<br>1.19    | 1.37<br>.03                               | 3.13<br>.01       | 1.91<br>.52   | 2.47<br>0     | 1.01<br>0    | 6.81<br>.02                                                 | 5.41<br>.03 | 3.18<br>.01 | 1.43<br>T   | 1.45<br>T   | 33.40<br>1.91  |      |        |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                      | P .37<br>C 0      | 3.23<br>.35     | 3.97<br>T                                 | 3.97<br>.27       | 4.04<br>.01   | 7.37<br>.42   | 4.24<br>.01  | 2.87<br>T                                                   | 1.87<br>T   | 6.61<br>.05 | 2.11<br>.27 | 3.48<br>.86 | 41.15<br>2.24  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                   |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas Watershed SW-12                        |             |             |             |             |                |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                      | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |              |                                                             |             |             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours      |                                                             | 12 hours    |             | 1 day       |             | 2 days         |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                           | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date         | Vol.                                                        | Date        | Vol.        | Date        | Vol.        | Date           | Vol. | Date   | Vol. |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                      | 4-19              | 3.47            | 4-19                                      | 2.42              | 4-19          | 2.76          | 4-23         | 3.29                                                        | 4-23        | 3.34        | 4-23        | 3.34        | 4-23           | 4.61 | 4-19   | 8.53 |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                      | 2-22              | .14             | 2-22                                      | .12               | 2-22          | .21           | 2-22         | .35                                                         | 2-22        | .58         | 2-22        | 1.11        | 2-22           | 1.19 | 2-21   | 1.19 |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                      | 6-23              | .71             | 6-23                                      | .37               | 12-31         | .44           | 12-31        | .63                                                         | 12-31       | .63         | 12-31       | .65         | 12-31          | .65  | 12-31  | 1.08 |
| Notes: Discharge reports: 1957, P and C, excellent except Apr., May 1957, good; Annual Max. discharges and volumes, excellent except Apr., May 1957, good. Watershed conditions: no appreciable change in land use or conservation practices since 1955. See page 42.24-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, ARS, ARS, June 1957 (reprinted 1961). |                   |                 |                                           |                   |               |               |              |                                                             |             |             |             |             |                |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                    |                   |                 |                                           |                   |               |               |              | Riesel (Waco), Texas Watershed SW-12                        |             |             |             |             |                |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           | Rainfall          |               |               |              | Runoff                                                      |             |             |             |             |                |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                      | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches)                                               |             |             |             |             |                |      |        |      |
| Event of June 4, 1957                                                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |                   |               |               |              |                                                             |             |             |             |             |                |      |        |      |
| 5-4-57                                                                                                                                                                                                                                                                                                                                                                                                    | 0                 | 0.01            | 6-4-57                                    | Raingage          | 70            | 6-4-57        |              |                                                             |             |             |             |             |                |      |        |      |
| 5-8                                                                                                                                                                                                                                                                                                                                                                                                       | .02               | 0               | 3:49p                                     | 0                 | 0             | 3:51p         |              | 0                                                           |             |             |             |             |                |      |        |      |
| 5-9                                                                                                                                                                                                                                                                                                                                                                                                       | .99               | .07             | :54                                       | 2.28              | .19           | 4:00          | .0077        | T                                                           |             |             |             |             |                |      |        |      |
| 5-10                                                                                                                                                                                                                                                                                                                                                                                                      | 0                 | T               | :59                                       | 2.76              | .42           | :04           | .0230        | T                                                           |             |             |             |             |                |      |        |      |
| 5-11                                                                                                                                                                                                                                                                                                                                                                                                      | 3.63              | 3.27            | 4:01                                      | 6.00              | .62           | :08           | .0690        | T                                                           |             |             |             |             |                |      |        |      |
| 5-12                                                                                                                                                                                                                                                                                                                                                                                                      |                   | .06             | :04                                       | 4.4               | .84           | :12           | .176         | .01                                                         |             |             |             |             |                |      |        |      |
| 5-13                                                                                                                                                                                                                                                                                                                                                                                                      | 1.62              | 1.51            | :08                                       | 5.25              | 1.19          | :16           | .318         | .03                                                         |             |             |             |             |                |      |        |      |
| 5-16                                                                                                                                                                                                                                                                                                                                                                                                      | .01               | 0               | :12                                       | 4.05              | 1.46          | :20           | .580         | .06                                                         |             |             |             |             |                |      |        |      |
| 5-17                                                                                                                                                                                                                                                                                                                                                                                                      | .03               | 0               | :16                                       | 1.05              | 1.53          | :22           | .610         | .08                                                         |             |             |             |             |                |      |        |      |
| 5-23                                                                                                                                                                                                                                                                                                                                                                                                      | .11               | 0               | :24                                       | 1.88              | 1.78          | :26           | .564         | .12                                                         |             |             |             |             |                |      |        |      |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                                      | T                 |                 | :50                                       | .03               | 1.80          | :32           | .383         | .16                                                         |             |             |             |             |                |      |        |      |
| 5-26                                                                                                                                                                                                                                                                                                                                                                                                      | .11               | 0               |                                           |                   |               | :36           | .241         | .18                                                         |             |             |             |             |                |      |        |      |
| 6-1                                                                                                                                                                                                                                                                                                                                                                                                       | .91               | T               |                                           |                   |               | :44           | .232         | .22                                                         |             |             |             |             |                |      |        |      |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                                       | .29               | 0               |                                           |                   |               | :50           | .161         | .24                                                         |             |             |             |             |                |      |        |      |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                                       | .46 1/            | 0               |                                           |                   |               | :55           | .116         | .25                                                         |             |             |             |             |                |      |        |      |
| Watershed Conditions: 100% native grass meadow, dense grass growing, no weeds.                                                                                                                                                                                                                                                                                                                            |                   |                 |                                           |                   |               |               |              |                                                             |             |             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | 5:04          | .0644        | .26                                                         |             |             |             |             |                |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | :16           | .0343        | .27                                                         |             |             |             |             |                |      |        |      |
| Event of June 23, 24, 1959                                                                                                                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               |               |              |                                                             |             |             |             |             |                |      |        |      |
| 5-23-59                                                                                                                                                                                                                                                                                                                                                                                                   | 0.25              | 0.06            | 6-23-59                                   | Raingage          | 70            | 6-23-59       |              |                                                             |             |             |             |             |                |      |        |      |
| 5-24                                                                                                                                                                                                                                                                                                                                                                                                      | .04               | 0               | 9:42p                                     | 0                 | 0             | 9:44p         | T            | 0                                                           |             |             |             |             |                |      |        |      |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                                      | .01               | 0               | :45                                       | 2.00              | .10           | :52           | .0077        | T                                                           |             |             |             |             |                |      |        |      |
| 6-2                                                                                                                                                                                                                                                                                                                                                                                                       | .18               | 0               | :53                                       | 3.00              | .50           | :58           | .0157        | T                                                           |             |             |             |             |                |      |        |      |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                                       | .02               | 0               | :57                                       | 3.15              | .71           | 10:02         | .0203        | T                                                           |             |             |             |             |                |      |        |      |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                                       | 1.47              | .01             | 10:00                                     | 3.00              | .86           | :05           | .0180        | T                                                           |             |             |             |             |                |      |        |      |
| 6-5                                                                                                                                                                                                                                                                                                                                                                                                       | .70               | T               | :07                                       | .77               | .95           | :16           | .0190        | .01                                                         |             |             |             |             |                |      |        |      |
| 6-12                                                                                                                                                                                                                                                                                                                                                                                                      | .18               | 0               | :14                                       | .86               | 1.05          | :20           | .0520        | .01                                                         |             |             |             |             |                |      |        |      |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                                      | .70               | 0               | :18                                       | 3.60              | 1.29          | :24           | .110         | .01                                                         |             |             |             |             |                |      |        |      |
| 6-22                                                                                                                                                                                                                                                                                                                                                                                                      | .36               | 0               | :21                                       | 2.00              | 1.39          | :28           | .176         | .02                                                         |             |             |             |             |                |      |        |      |
| 6-23                                                                                                                                                                                                                                                                                                                                                                                                      | .69 2/            | T 3/            | :26                                       | 2.40              | 1.59          | :32           | .350         | .04                                                         |             |             |             |             |                |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 2.994. 1/ Prior rainfall ended 2:50p. 2/ Rainfall ended 9:14p. 3/ Trace of runoff prior to 9:44p.                                                                                                                                                                                                                                                   |                   |                 |                                           |                   |               |               |              |                                                             |             |             |             |             |                |      |        |      |

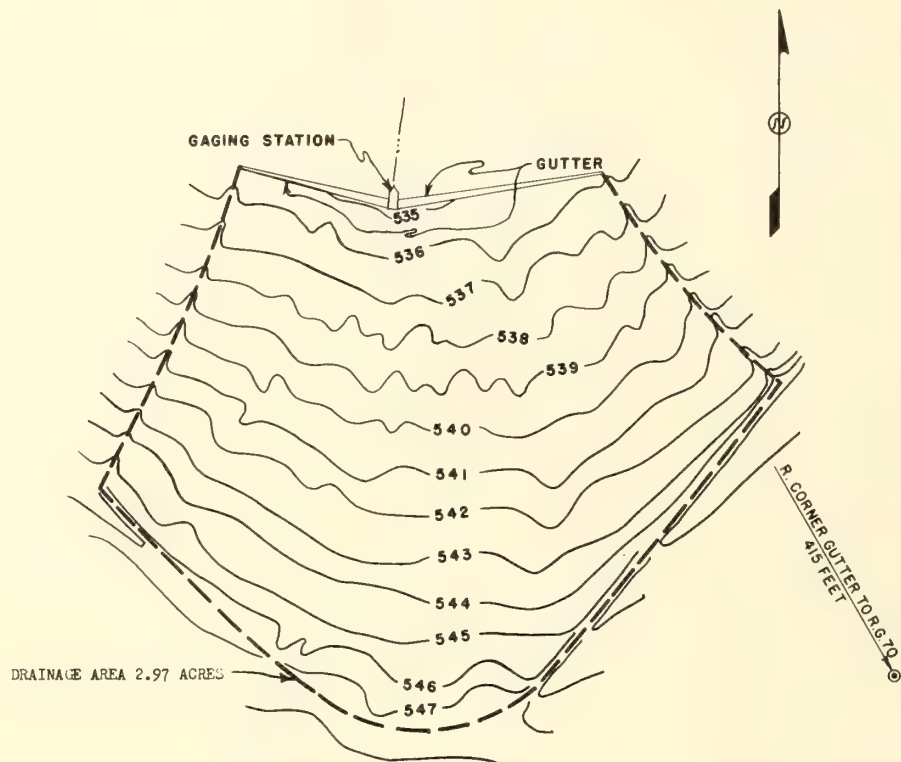
Cooperative Research Project of USDA and Texas Agricultural Experiment Station



| SELECTED RUNOFF EVENTS                                                                                     |                      |                    |                  |                      | Riesel (Waco), Texas |                  | Watershed SW-12 |                  |
|------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|----------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                      |                      |                    | Rainfall         |                      |                      | Runoff           |                 |                  |
| Date                                                                                                       | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches)     | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 23, 24, 1959 - Continued                                                                     |                      |                    |                  |                      |                      |                  |                 |                  |
| Watershed Conditions: 100%<br>native grass meadow, good cover,<br>20" high, ready to harvest, no<br>weeds. |                      |                    | 6-23-59          | Raingage             | 70                   | 6-23-59          |                 |                  |
|                                                                                                            |                      |                    | 10:31p           | 2.28                 | 1.78                 | 10:37p           | 0.564           | 0.08             |
|                                                                                                            |                      |                    | :36              | 1.20                 | 1.88                 | :46              | .714            | .18              |
|                                                                                                            |                      |                    | :42              | 1.00                 | 1.98                 | :52              | .594            | .24              |
|                                                                                                            |                      |                    | :44              | 1.80                 | 2.04                 | 11:01            | .350            | .31              |
|                                                                                                            |                      |                    |                  |                      |                      | :12              | .161            | .35              |
|                                                                                                            |                      |                    |                  |                      |                      | :23              | .0830           | .38              |
|                                                                                                            |                      |                    |                  |                      |                      | :34              | .0447           | .39              |
|                                                                                                            |                      |                    |                  |                      |                      | :40              | .0313           | .39              |
|                                                                                                            |                      |                    |                  |                      |                      | :55              | .0157           | .40              |
|                                                                                                            |                      |                    |                  |                      |                      | 6-24-59          |                 |                  |
|                                                                                                            |                      |                    |                  |                      |                      | 12:14a           | .0077           | .40              |
|                                                                                                            |                      |                    |                  |                      |                      | :58              | .0023           | .40              |
|                                                                                                            |                      |                    |                  |                      |                      | 10:30            | 0               | .41              |
| Notes: To convert runoff in in/hr to cfs, multiply by 2.994.                                               |                      |                    |                  |                      |                      |                  |                 |                  |



RIESEL (WACO), TEXAS Watershed SW-12



#### LEGEND

- Watershed Boundary
- Natural Waterway
- 540 --- Contours 1 Foot
- ⊙ Rain Gage

SCALE - FEET  
50 0 50 100

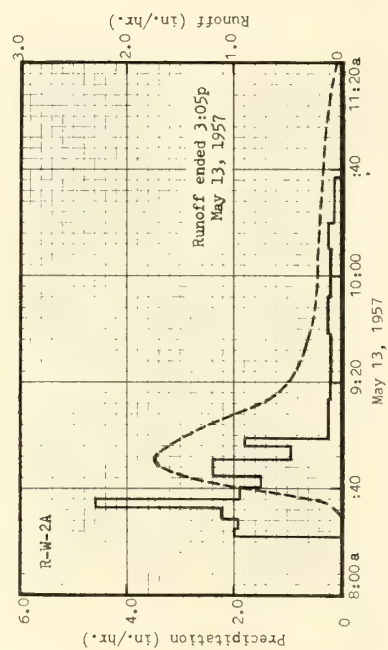
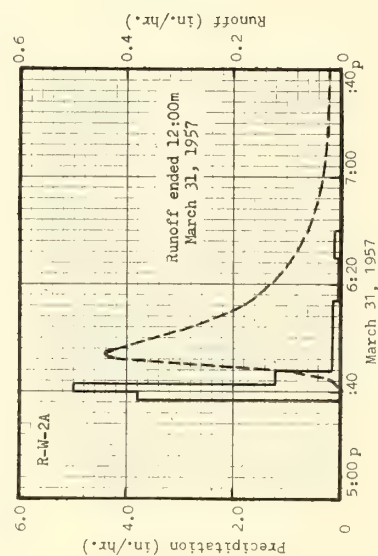
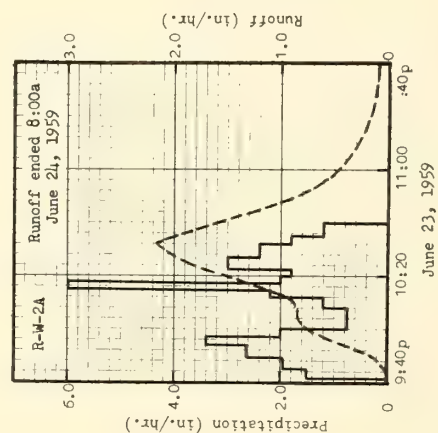
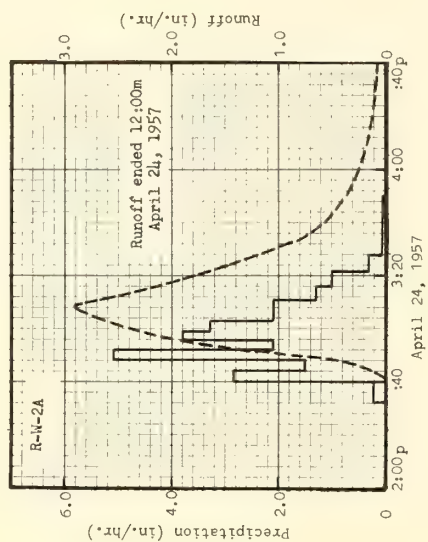
RIESEL (WACO), TEXAS  
Watershed SW-12



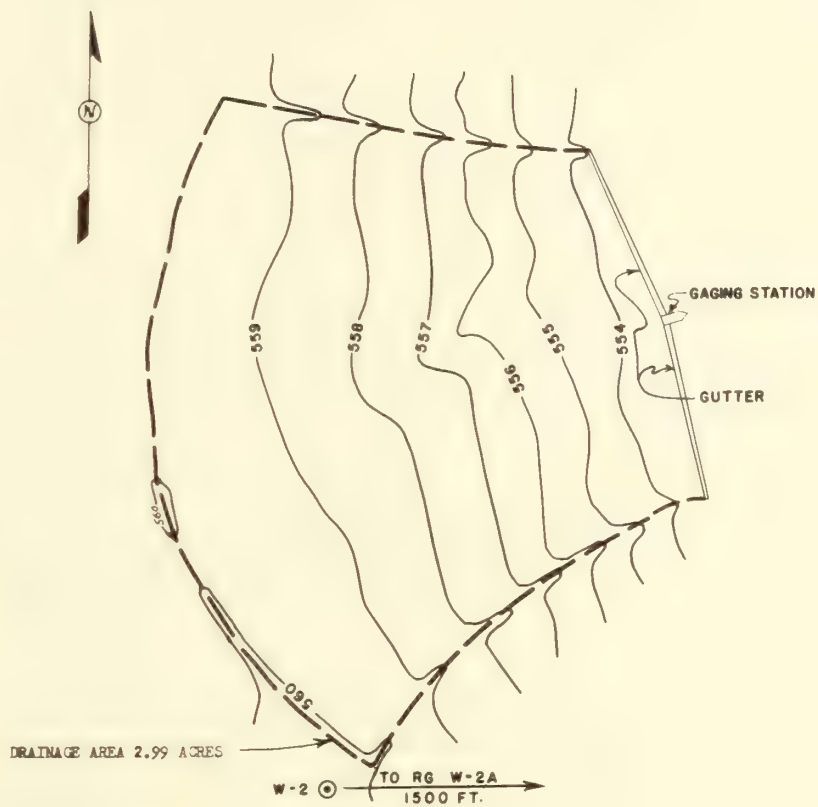


| SELECTED RUNOFF EVENTS                                                                                                                                                                                    |                      |                    |                  |                      |                  | Riesel (Waco), Texas Watershed SW-17 |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|--------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                     |                      |                    | Rainfall         |                      |                  | Runoff                               |                 |                  |
| Date                                                                                                                                                                                                      | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                     | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of April 24, 1957 - Continued                                                                                                                                                                       |                      |                    |                  |                      |                  |                                      |                 |                  |
| 4-21-57                                                                                                                                                                                                   | 0.21                 | T                  | 4-24-57          | Raingage             | W-2A             | 4-24-57                              |                 |                  |
| 4-22                                                                                                                                                                                                      | .30                  | T                  | 3:16p            | 1.32                 | 1.60             | 3:21p                                | 1.70            | 1.20             |
| 4-23                                                                                                                                                                                                      | 3.98                 | 3.35               | :22              | 1.00                 | 1.70             | :34                                  | .770            | 1.46             |
| 4-24                                                                                                                                                                                                      | .02 <u>1/</u>        | 0                  | :28              | .30                  | 1.73             | :43                                  | .498            | 1.55             |
|                                                                                                                                                                                                           |                      |                    | :50              | .05                  | 1.75             | :53                                  | .310            | 1.62             |
| Watershed Conditions: 100%<br>Bermuda grass pasture with weeds<br>and grass 10" high.                                                                                                                     |                      |                    |                  |                      |                  | 4:06                                 | .182            | 1.67             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | :21                                  | .112            | 1.70             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | :38                                  | .0710           | 1.73             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | :56                                  | .0464           | 1.75             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | 5:45                                 | .0202           | 1.77             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | 7:40                                 | .0046           | 1.79             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | 12:00m                               | .0007           | 1.80             |
| Event of May 13, 1957                                                                                                                                                                                     |                      |                    |                  |                      |                  |                                      |                 |                  |
| 4-13-57                                                                                                                                                                                                   | 0.04                 | 0                  | 5-13-57          | Raingage             | W-2A             | 5-13-57                              |                 |                  |
| 4-15                                                                                                                                                                                                      | .02                  | 0                  | 8:22a            | 0                    | 0                | 8:24a                                | 0.0003          | 0                |
| 4-19                                                                                                                                                                                                      | 4.73                 | 3.00               | :25              | 2.00                 | .10              | :28                                  | .0013           | 0                |
| 4-20                                                                                                                                                                                                      | .23                  | .12                | :29              | 1.95                 | .23              | :30                                  | .0063           | T                |
| 4-21                                                                                                                                                                                                      | .21                  | T                  | :33              | 2.25                 | .38              | :32                                  | .0282           | T                |
| 4-22                                                                                                                                                                                                      | .30                  | T                  | :36              | 4.60                 | .61              | :34                                  | .0981           | T                |
| 4-23                                                                                                                                                                                                      | 3.98                 | 3.35               | :41              | 1.92                 | .77              | :36                                  | .295            | .01              |
| 4-24                                                                                                                                                                                                      | 1.83                 | 1.80               | :45              | 1.50                 | .87              | :38                                  | .604            | .02              |
| 4-25                                                                                                                                                                                                      | 0                    | T                  | :51              | 2.40                 | 1.11             | :40                                  | .816            | .05              |
| 4-26                                                                                                                                                                                                      | 1.44                 | .81                | :56              | .96                  | 1.19             | :45                                  | 1.48            | .15              |
| 4-27                                                                                                                                                                                                      | .27                  | .35                | :59              | 1.80                 | 1.28             | :50                                  | 1.74            | .28              |
| 4-28                                                                                                                                                                                                      | 1.09                 | .65                | 9:14             | .24                  | 1.34             | :56                                  | 1.66            | .45              |
| 4-29                                                                                                                                                                                                      | .06                  | .04                | :38              | .20                  | 1.42             | 9:00                                 | 1.50            | .56              |
| 4-30                                                                                                                                                                                                      | .01                  | T                  | :52              | .26                  | 1.48             | :06                                  | 1.13            | .69              |
| 5-1                                                                                                                                                                                                       | .37                  | T                  | 10:10            | .20                  | 1.54             | :12                                  | .763            | .78              |
| 5-2                                                                                                                                                                                                       | 0                    | T                  | :20              | .24                  | 1.58             | :18                                  | .574            | .85              |
| 5-3                                                                                                                                                                                                       | .84                  | .48                | :37              | .14                  | 1.62             | :24                                  | .451            | .90              |
| 5-4, 7                                                                                                                                                                                                    | 0                    | .01                |                  |                      |                  | :29                                  | .381            | .94              |
| 5-8                                                                                                                                                                                                       | .02                  | T                  |                  |                      |                  | :44                                  | .266            | 1.02             |
| 5-9                                                                                                                                                                                                       | .89                  | .02                |                  |                      |                  | 10:12                                | .214            | 1.13             |
| 5-10                                                                                                                                                                                                      | 0                    | .01                |                  |                      |                  | :36                                  | .178            | 1.21             |
| 5-11                                                                                                                                                                                                      | 3.92                 | 3.11               |                  |                      |                  | :59                                  | .115            | 1.27             |
| 5-12                                                                                                                                                                                                      | 0                    | .06                |                  |                      |                  | 11:19                                | .0687           | 1.30             |
| 5-13                                                                                                                                                                                                      | 0                    | T <u>2/</u>        |                  |                      |                  | :37                                  | .0444           | 1.31             |
| Watershed Conditions: 100%<br>Bermuda grass pasture with grass<br>and weeds 12" high, dense growth.                                                                                                       |                      |                    |                  |                      |                  | 12:05p                               | .0255           | 1.33             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | :40                                  | .0156           | 1.34             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | 2:15                                 | .0046           | 1.35             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | 3:05                                 | .0023           | 1.36             |
| Event of June 23, 24, 1959                                                                                                                                                                                |                      |                    |                  |                      |                  |                                      |                 |                  |
| 5-23-59                                                                                                                                                                                                   | 0.14                 | 0.06               | 6-23-59          | Raingage             | W-2A             | 6-23-59                              |                 |                  |
| 5-24                                                                                                                                                                                                      | .02                  | .02                | 9:41p            | 0                    | 0                | 9:42p                                | 0.0027          | 0                |
| 5-25                                                                                                                                                                                                      | T                    | .02                | :45              | 1.50                 | .10              | :44                                  | .0046           | T                |
| 5-26, 6-1                                                                                                                                                                                                 | 0                    | .09                | :49              | 1.95                 | .23              | :46                                  | .0312           | T                |
| 6-2                                                                                                                                                                                                       | .19                  | .01                | :54              | 2.64                 | .45              | :48                                  | .0481           | T                |
| 6-3                                                                                                                                                                                                       | .02                  | .01                | :57              | 3.40                 | .62              | :51                                  | .190            | .01              |
| 6-4                                                                                                                                                                                                       | 1.39                 | .15                | 10:00            | 2.00                 | .72              | :53                                  | .315            | .02              |
| 6-5                                                                                                                                                                                                       | .51                  | .04                | :08              | .75                  | .82              | :55                                  | .451            | .03              |
| 6-6, 11                                                                                                                                                                                                   | 0                    | .03                | :12              | 1.20                 | .90              | 10:00                                | .763            | .08              |
| 6-12                                                                                                                                                                                                      | .26                  | T                  | :15              | 2.20                 | 1.01             | :04                                  | .833            | .13              |
| 6-13, 19                                                                                                                                                                                                  | 0                    | .06                | :17              | 6.00                 | 1.21             | :09                                  | .869            | .20              |
| 6-20                                                                                                                                                                                                      | .77                  | .01                | :20              | 2.00                 | 1.31             | :13                                  | 1.01            | .26              |
| 6-21                                                                                                                                                                                                      | 0                    | T                  | :23              | 1.80                 | 1.40             | :18                                  | 1.35            | .36              |
| 6-22                                                                                                                                                                                                      | .31                  | T                  | :27              | 3.00                 | 1.60             | :23                                  | 1.77            | .49              |
| 6-23                                                                                                                                                                                                      | .84 <u>3/</u>        | .01 <u>4/</u>      | :32              | 2.40                 | 1.80             | :28                                  | 2.00            | .65              |
| Watershed Conditions: 100%<br>Bermuda grass pasture, grass 12"<br>high, no weeds, dense growth.                                                                                                           |                      |                    |                  |                      |                  | :35                                  | 2.17            | .79              |
|                                                                                                                                                                                                           |                      |                    | :40              | 1.20                 | 1.99             | :35                                  | 1.94            | .89              |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | :41                                  | 1.50            | 1.07             |
|                                                                                                                                                                                                           |                      |                    |                  |                      |                  | :46                                  | 1.13            | 1.17             |
| Notes: To convert runoff in in/hr to cfs, multiply by 3.014. <u>1/</u> Precipitation prior to 2:32p. <u>2/</u> Runoff prior to 8:24a.<br><u>3/</u> Rainfall ended 9:07p. <u>4/</u> Runoff prior to 9:42p. |                      |                    |                  |                      |                  |                                      |                 |                  |

| SELECTED RUNOFF EVENTS                                       |                      |                    | Riesel (Waco), Texas                   |                      |                  | Watershed SW-17  |                 |                  |
|--------------------------------------------------------------|----------------------|--------------------|----------------------------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                        |                      |                    | Rainfall                               |                      |                  | Runoff           |                 |                  |
| Date                                                         | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                       | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
|                                                              |                      |                    | Event of June 23, 24, 1959 - Continued |                      |                  |                  |                 |                  |
|                                                              |                      |                    |                                        |                      |                  | 6-23-59          |                 |                  |
|                                                              |                      |                    |                                        |                      |                  | 1:56p            | 0.561           | 1.31             |
|                                                              |                      |                    |                                        |                      |                  | 11:06            | .315            | 1.38             |
|                                                              |                      |                    |                                        |                      |                  | :16              | .190            | 1.42             |
|                                                              |                      |                    |                                        |                      |                  | :29              | .115            | 1.45             |
|                                                              |                      |                    |                                        |                      |                  | :39              | .0826           | 1.47             |
|                                                              |                      |                    |                                        |                      |                  | :50              | .0517           | 1.48             |
|                                                              |                      |                    |                                        |                      |                  | 12:00 m          | .0375           | 1.49             |
|                                                              |                      |                    |                                        |                      |                  | 6-24-59          |                 |                  |
|                                                              |                      |                    |                                        |                      |                  | 12:31a           | .0202           | 1.50             |
|                                                              |                      |                    |                                        |                      |                  | :50              | .0116           | 1.51             |
|                                                              |                      |                    |                                        |                      |                  | 1:30             | .0046           | 1.52             |
|                                                              |                      |                    |                                        |                      |                  | 2:15             | .0023           | 1.52             |
|                                                              |                      |                    |                                        |                      |                  | 3:00             | .0007           | 1.52             |
|                                                              |                      |                    |                                        |                      |                  | 8:00             | T               | 1.52             |
| Notes: To convert runoff in in/hr to cfs, multiply by 3.614. |                      |                    |                                        |                      |                  |                  |                 |                  |

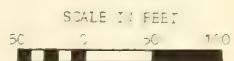


RIESEL (WACO), TEXAS Watershed SW-17



#### LEGEND

- Watershed Boundary
- Recording Point
- 555 --- Contours 1 Foot



RIESEL (WACO), TEXAS

Watershed SW-17



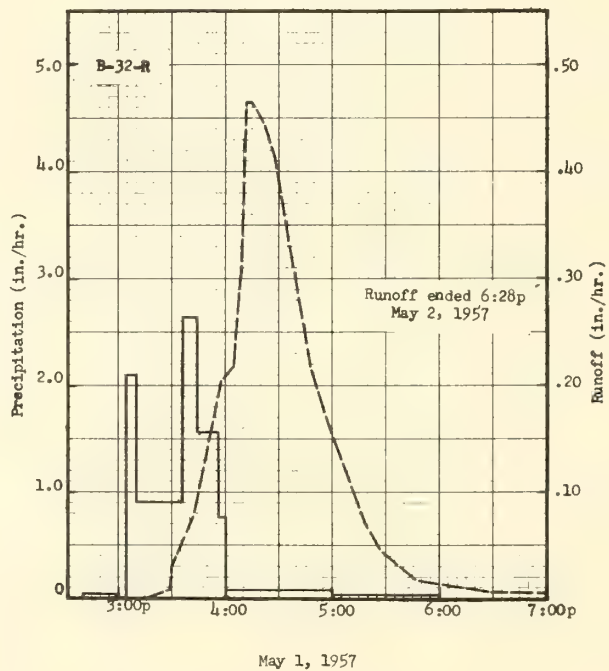
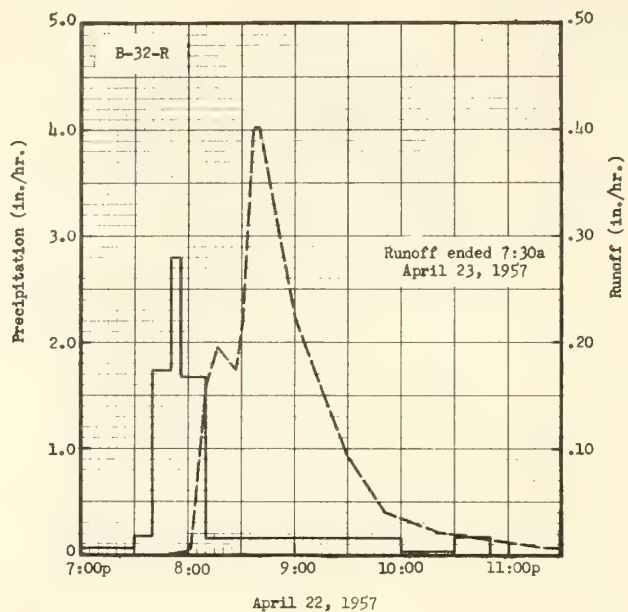
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed W-3<br>(Area - 481 acres) |             |             |           |           |               |      |        |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|--------------------------------------------------------|-------------|-------------|-----------|-----------|---------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Jan.                    | Feb.               | Mar.                                      | Apr.                 | May              | June             | July            | Aug.                                                   | Sept.       | Oct.        | Nov.      | Dec.      | Year          |      |        |      |
| 1956<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.22<br>0               | 0.10<br>T          | 0.29<br>0                                 | 1.17<br>T            | 0.65<br>0        | 4.25<br>.79      | 2.61<br>.26     | 1.40<br>.07                                            | 1.26<br>.09 | 0.86<br>.03 | 0.09<br>0 | 0.05<br>0 | 12.95<br>1.24 |      |        |      |
| 1957<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | .14<br>0                | .06<br>0           | 1.75<br>T                                 | 2.92<br>.40          | 6.66<br>1.78     | 11.30<br>5.06    | .18<br>0        | 5.32<br>.89                                            | .52<br>0    | 1.31<br>0   | .53<br>0  | .15<br>0  | 30.84<br>8.13 |      |        |      |
| 1958<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | .10<br>0                | 1.33<br>.02        | 2.20<br>.38                               | 1.76<br>.13          | 1.50<br>0        | 2.81<br>.31      | 4.47<br>.30     | 3.72<br>.36                                            | 1.56<br>.02 | .06<br>0    | .44<br>0  | .05<br>0  | 20.00<br>1.52 |      |        |      |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | .27<br>0                | .29<br>.15         | 3.58<br>.31                               | .86<br>.01           | 6.31<br>1.04     | 4.76<br>.83      | 2.93<br>1.80    | 2.99<br>.13                                            | 4.56<br>.72 | 1.83<br>.09 | 0<br>0    | .08<br>0  | 28.46<br>5.08 |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                         |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed W-3                       |             |             |           |           |               |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | MAXIMUM DISCHARGE       |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                                                        | 12 hours    |             | 1 day     |           | 2 days        |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Date                    | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.                                                   | Date        | Vol.        | Date      | Vol.      | Date          | Vol. | Date   | Vol. |
| 1956 1/                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6-26                    | .21                | 6-26                                      | .19                  | 6-26             | .30              | 6-25            | .38                                                    | 6-25        | .38         | 6-25      | .38       | 6-25          | .64  | 6-25   | .96  |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6-15                    | 1.18               | 6-15                                      | .64                  | 6-15             | 1.07             | 6-15            | 2.28                                                   | 6-15        | 3.12        | 6-15      | 3.52      | 6-15          | 4.69 | 6-10   | 4.80 |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6-12                    | .18                | 6-12                                      | .15                  | 6-12             | .24              | 6-12            | .27                                                    | 6-12        | .28         | 6-12      | .31       | 6-12          | .32  | 3-29   | .50  |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7-3                     | 2.00               | 7-3                                       | 1.32                 | 7-3              | 1.67             | 7-3             | 1.80                                                   | 7-3         | 1.80        | 7-3       | 1.80      | 7-3           | 1.80 | 6-28   | 2.35 |
| Notes: Quality of Records: Monthly P, excellent; monthly Q, good to excellent except during Dec., Jan., Feb. and March which are fair. Watershed conditions: 1956 - crops, including pasture, were fair to poor; 1957 - crops, pasture, meadow excellent until June storms which caused washing and replanting of crops. Crops were good. Wheat was good to excellent. 1958 and 1959 - crops were good to excellent. 1/ 1956 values are revised and supersede those previously reported.                                                                                                                                                                                                     |                         |                    |                                           |                      |                  |                  |                 |                                                        |             |             |           |           |               |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                         |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed W-3                       |             |             |           |           |               |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                    |                                           | Rainfall             |                  |                  |                 | Runoff                                                 |             |             |           |           |               |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Rainfall 2/<br>(inches) | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches)                                       |             |             |           |           |               |      |        |      |
| Event of April 22 and 23, 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                    |                                           |                      |                  |                  |                 |                                                        |             |             |           |           |               |      |        |      |
| 3-23, 25-57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.16                    | T                  | 4-22-57                                   | Raingage             | B-32-R           | 4-22-57          |                 |                                                        |             |             |           |           |               |      |        |      |
| 3-31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .07                     | 0                  | 6:10p                                     | 0                    | 0                | 7:50p            | 0               | 0                                                      |             |             |           |           |               |      |        |      |
| 4-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .61                     | .01                | 7:30                                      | .05                  | .08              | :58              | .0020           | .0001                                                  |             |             |           |           |               |      |        |      |
| 4-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .52                     | .01                | :40                                       | .18                  | .11              | 8:02             | .0064           | .0004                                                  |             |             |           |           |               |      |        |      |
| 4-11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .02                     | 0                  | :50                                       | 1.74                 | .40              | :10              | .158            | .0119                                                  |             |             |           |           |               |      |        |      |
| 4-17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .02                     | 0                  | :56                                       | 2.80                 | .68              | :16              | .197            | .0297                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 8:10                                      | 1.68                 | 1.07             | :26              | .0605           | .173                                                   |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 10:00                                     | .15                  | 1.34             | :30              | .219            | .0736                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | :30                                       | .02                  | 1.35             | :36              | .404            | .1042                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | :50                                       | .18                  | 1.41             | :40              | .404            | .1311                                                  |             |             |           |           |               |      |        |      |
| Watershed Conditions: Crops in following condition:<br>Corn - not planted<br>Wheat - 3" high, good condition<br>Oats - just planted<br>Sorghum - not planted<br>Alfalfa - fair condition, with some winter kill.<br>Pasture and meadow dormant with fair cover. Seed bed preparation for corn and sorghum was well under way. The land use in percentage of the watershed area was as follows:<br>Oats . . . . . 6.5%<br>Wheat . . . . . 16.5%<br>Fallow . . . . . 9.0%<br>Sorghum . . . . . 38.0%<br>Alfalfa . . . . . 1.5%<br>Sweet Clover . . . . . 2.0%<br>Sudan . . . . . 2.5%<br>Pasture . . . . . 18.5%<br>Meadow . . . . . 2.0%<br>Roads . . . . . 1.0%<br>Farmsteads . . . . . 2.5% |                         |                    |                                           |                      |                  |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 11:00                                     | .00                  | 1.41             | 9:00             | .223            | .2373                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 12:00m                                    | .01                  | 1.42             | :30              | .0903           | .3160                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    |                                           |                      |                  | :50              | .0419           | .3380                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 4-22-57                                   | Raingage             | A-31-R           | 10:20            | .0202           | .3535                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 6:00p                                     | 0                    | 0                | :50              | .0145           | .3622                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 7:30                                      | .02                  | .03              | 11:20            | .0091           | .3681                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | :36                                       | .10                  | .04              | 4-23-57          |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | :40                                       | 2.85                 | .23              | 7:30a            | 0               | .3771                                                  |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | :44                                       | 1.95                 | .36              |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 8:00                                      | 2.51                 | 1.03             |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | :04                                       | 1.65                 | 1.14             |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | :20                                       | .26                  | 1.21             |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 9:50                                      | .14                  | 1.42             |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 10:30                                     | .03                  | 1.44             |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 11:00                                     | .16                  | 1.52             |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 4-22-57                                   | Raingage             | B-10-R 3/        |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 5:40p                                     | 0                    | 0                |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 6:30                                      | .05                  | .04              |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | 7:30                                      | .00                  | .04              |                  |                 |                                                        |             |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                    | :36                                       | 1.00                 | .14              |                  |                 |                                                        |             |             |           |           |               |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 485.0. Weighted precipitation for event of April 22-23, 1957 is 1.50 inches by the Thiessen method. For map of watershed, see page 44.4-8 or refer to Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS, SWC, January 1960, page 44.1-8. 2/ All antecedent rainfall is weighted by Thiessen method using same raingages as those shown for the event. 3/ Raingage B-10-R is located approximately 3/4 mile NW of gaging station, west side of road and on the watershed boundary.                                                                                                                     |                         |                    |                                           |                      |                  |                  |                 |                                                        |             |             |           |           |               |      |        |      |

| SELECTED RUNOFF EVENTS                                                                  |                      |                    |                  |                      | Hastings, Nebraska Watershed W-3 |                  |                 |                  |
|-----------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|----------------------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                   |                      |                    | Rainfall         |                      |                                  | Runoff           |                 |                  |
| Date                                                                                    | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches)                 | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of April 22 and 23, 1957 (continued)                                              |                      |                    |                  |                      |                                  |                  |                 |                  |
|                                                                                         |                      |                    | 7:40p            | 2.70                 | .32                              |                  |                 |                  |
|                                                                                         |                      |                    | :46              | 1.90                 | .51                              |                  |                 |                  |
|                                                                                         |                      |                    | :48              | 3.00                 | .61                              |                  |                 |                  |
|                                                                                         |                      |                    | :52              | 2.55                 | .78                              |                  |                 |                  |
|                                                                                         |                      |                    | :58              | 1.80                 | .96                              |                  |                 |                  |
|                                                                                         |                      |                    | 8:00             | .90                  | .99                              |                  |                 |                  |
|                                                                                         |                      |                    | :06              | 2.10                 | 1.20                             |                  |                 |                  |
|                                                                                         |                      |                    | 11:00            | .12                  | 1.56                             |                  |                 |                  |
|                                                                                         |                      |                    | 4-22-57          | Raingage             | Met.                             |                  |                 |                  |
|                                                                                         |                      |                    | 5:56p            | 0                    | 0                                |                  |                 |                  |
|                                                                                         |                      |                    | 11:03            |                      | 1.43                             |                  |                 |                  |
|                                                                                         |                      |                    | 4-22-57          | Raingage             | B-33-R                           |                  |                 |                  |
|                                                                                         |                      |                    | 6:16p            | 0                    | 0                                |                  |                 |                  |
|                                                                                         |                      |                    | 11:00            |                      | 1.45                             |                  |                 |                  |
|                                                                                         |                      |                    | 4-22-57          | Raingage             | B-36-R                           |                  |                 |                  |
|                                                                                         |                      |                    | 6:10p            | 0                    | 0                                |                  |                 |                  |
|                                                                                         |                      |                    | 11:00            |                      | 1.48                             |                  |                 |                  |
| Event of May 1 and 2, 1957                                                              |                      |                    |                  |                      |                                  |                  |                 |                  |
| 4-2-57                                                                                  | .61                  | .01                | 5-1-57           | Raingage             | B-32-R                           | 5-1-57           |                 |                  |
| 4-3                                                                                     | .52                  | .01                | 2:40p            | 0                    | 0                                | 3:16p            | 0               | 0                |
| 4-11                                                                                    | .02                  | 0                  | 3:00             | .03                  | .01                              | :28              | .0091           | .0003            |
| 4-17                                                                                    | .02                  | 0                  | :04              | 0                    | .01                              | :30              | .0301           | .0010            |
| 4-22                                                                                    | 1.50                 | .38                | :10              | 2.10                 | .22                              | :42              | .0779           | .0124            |
| 4-30                                                                                    | .25                  | 0                  | :36              | .90                  | .61                              | :58              | .205            | .0506            |
|                                                                                         |                      |                    | :44              | 2.63                 | .96                              | 4:04             | .219            | .0718            |
|                                                                                         |                      |                    | :56              | 1.55                 | 1.27                             | :08              | .301            | .0895            |
|                                                                                         |                      |                    | 4:00             | .75                  | 1.32                             | :12              | .466            | .1158            |
|                                                                                         |                      |                    | 5:00             | .08                  | 1.40                             | :16              | .466            | .1469            |
|                                                                                         |                      |                    | 6:00             | .02                  | 1.42                             | :22              | .447            | .1925            |
|                                                                                         |                      |                    |                  |                      |                                  | :28              | .412            | .2355            |
|                                                                                         |                      |                    | 5-1-57           | Raingage             | A-31-R                           | :48              | .219            | .3420            |
|                                                                                         |                      |                    | 2:20p            | 0                    | 0                                | :58              | .165            | .3740            |
|                                                                                         |                      |                    | 3:00             | .04                  | .03                              | 5:18             | .0716           | .4128            |
|                                                                                         |                      |                    | :20              | 1.11                 | .40                              | :28              | .0427           | .4224            |
|                                                                                         |                      |                    | :24              | .30                  | .42                              | :48              | .0197           | .4322            |
|                                                                                         |                      |                    | :40              | 1.84                 | .91                              | 6:28             | .0066           | .4403            |
|                                                                                         |                      |                    | :50              | 1.14                 | 1.10                             | 5-2-57           |                 |                  |
|                                                                                         |                      |                    | :54              | 2.10                 | 1.24                             | 6:28p            | 0               | .4470            |
|                                                                                         |                      |                    | 4:34             | .16                  | 1.35                             |                  |                 |                  |
|                                                                                         |                      |                    | 6:04             | .05                  | 1.42                             |                  |                 |                  |
|                                                                                         |                      |                    | 5-1-57           | Raingage             | B-10-R                           |                  |                 |                  |
|                                                                                         |                      |                    | 2:34p            | 0                    | 0                                |                  |                 |                  |
|                                                                                         |                      |                    | :40              | .10                  | .01                              |                  |                 |                  |
|                                                                                         |                      |                    | 3:03             | 0                    | .01                              |                  |                 |                  |
|                                                                                         |                      |                    | :10              | 1.54                 | .19                              |                  |                 |                  |
|                                                                                         |                      |                    | :22              | 1.10                 | .41                              |                  |                 |                  |
|                                                                                         |                      |                    | :34              | .45                  | .50                              |                  |                 |                  |
|                                                                                         |                      |                    | :40              | 3.10                 | .81                              |                  |                 |                  |
|                                                                                         |                      |                    | :56              | 1.31                 | 1.16                             |                  |                 |                  |
|                                                                                         |                      |                    | 4:06             | .24                  | 1.20                             |                  |                 |                  |
|                                                                                         |                      |                    | :38              | .04                  | 1.22                             |                  |                 |                  |
|                                                                                         |                      |                    | :50              | 0                    | 1.22                             |                  |                 |                  |
|                                                                                         |                      |                    | 8:00             | .01                  | 1.27                             |                  |                 |                  |
|                                                                                         |                      |                    | 5-1-57           | Raingage             | Met.                             |                  |                 |                  |
|                                                                                         |                      |                    | 2:20p            | 0                    | 0                                |                  |                 |                  |
|                                                                                         |                      |                    | 5:20             |                      | 1.51                             |                  |                 |                  |
|                                                                                         |                      |                    | 5-1-57           | Raingage             | B-33-R                           |                  |                 |                  |
|                                                                                         |                      |                    | NR               |                      | 1.36                             |                  |                 |                  |
|                                                                                         |                      |                    | 5-1-57           | Raingage             | B-36-R                           |                  |                 |                  |
|                                                                                         |                      |                    | 2:30 p           | 0                    | 0                                |                  |                 |                  |
|                                                                                         |                      |                    | 6:04             |                      | 1.41                             |                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 485.00.                           |                      |                    |                  |                      |                                  |                  |                 |                  |
| Weighted Precipitation for May 1-2, 1957 is 1.36 inches by the Thiessen polygon method. |                      |                    |                  |                      |                                  |                  |                 |                  |

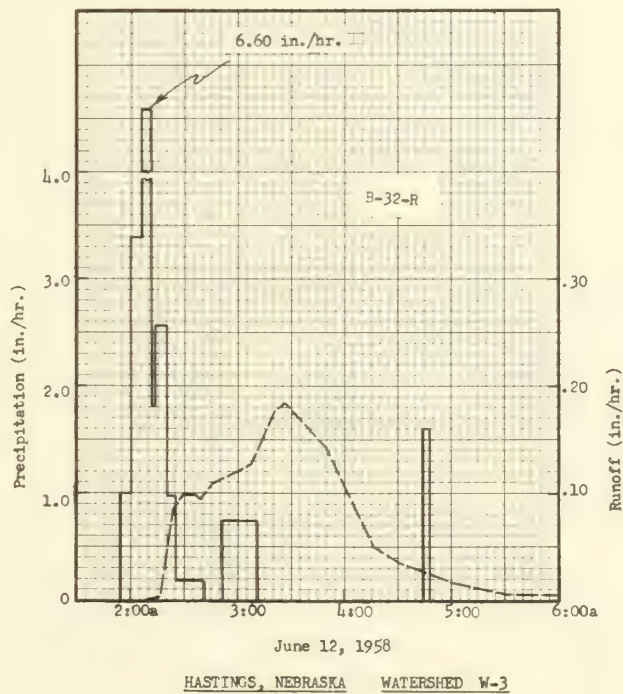
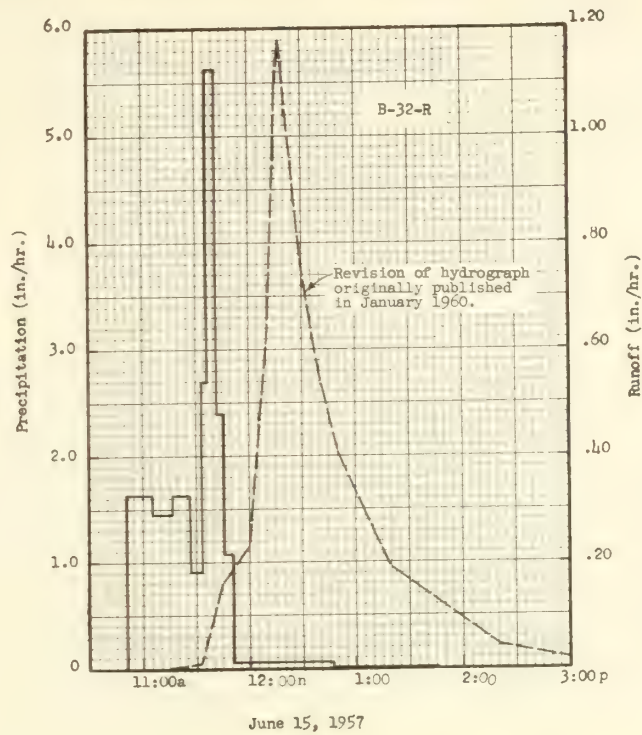
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed W-3 |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                     |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                      | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 15, 1957 1/                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  |                                  |                 |                  |
| 5-29-57                                                                                                                                                                                                                                                                                                                                                                                                   | 0.84                 | 0.04               | 6-15-57          | Raingage             | B-32-R           | 6-15-57                          |                 |                  |
| 5-31                                                                                                                                                                                                                                                                                                                                                                                                      | .33                  | .01                | 10:51a           | 0                    | 0                | 11:16a                           | 0               | 0                |
| 6-10                                                                                                                                                                                                                                                                                                                                                                                                      | .78                  | .04                | 11:05            | 1.63                 | .38              | :32                              | .0091           | .0009            |
| 6-13                                                                                                                                                                                                                                                                                                                                                                                                      | .86                  | .09                | :17              | 1.45                 | .67              | :45                              | .160            | .0236            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :27              | 1.62                 | .94              | 12:00n                           | .233            | .0705            |
| Watershed Conditions: The wheat was fully headed, about 4' high, and in excellent condition; the sorghum was not out of the ground. Corn was about 6" high with poor stand. Pasture was in excellent condition with height of 12". Meadow in excellent condition, heading out, and about 11" high. All cultivation was in straight rows. The land use in percentage of the watershed area was as follows: |                      |                    | :33              | .90                  | 1.03             | :10 p                            | .629            | .1363            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :37              | 2.70                 | 1.21             | :15                              | 1.16            | .2084            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :42              | 5.64                 | 1.68             | :18                              | 1.18            | .2654            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :46              | 2.10                 | 1.84             | :30                              | .767            | .4600            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :51              | 1.08                 | 1.93             | :40                              | .555            | .5701            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 12:46p           | .05                  | 1.98             | :50                              | .412            | .6506            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 1:46             | .01                  | 1.99             | 1:20                             | .197            | .7913            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 6-15-57          | Raingage             | A-31-R           | 2:20                             | .0443           | .9088            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 10:58a           | 0                    | 0                | 3:00                             | .0145           | .9266            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 11:02            | 1.05                 | .07              | 5:30 2/                          | .0022           | .9406            |
| Oats . . . . .                                                                                                                                                                                                                                                                                                                                                                                            | 6.5%                 |                    | :08              | 1.60                 | .23              |                                  |                 |                  |
| Wheat . . . . .                                                                                                                                                                                                                                                                                                                                                                                           | .16.5%               |                    | :10              | 2.10                 | .30              |                                  |                 |                  |
| Fallow . . . . .                                                                                                                                                                                                                                                                                                                                                                                          | 9.0%                 |                    | :16              | 1.20                 | .42              |                                  |                 |                  |
| Sorghum . . . . .                                                                                                                                                                                                                                                                                                                                                                                         | .38.0%               |                    | :21              | 1.32                 | .53              |                                  |                 |                  |
| Alfalfa . . . . .                                                                                                                                                                                                                                                                                                                                                                                         | 1.5%                 |                    | :25              | 2.70                 | .71              |                                  |                 |                  |
| Sweet Clover . . . . .                                                                                                                                                                                                                                                                                                                                                                                    | 2.0%                 |                    | :38              | 1.52                 | 1.04             |                                  |                 |                  |
| Sudan . . . . .                                                                                                                                                                                                                                                                                                                                                                                           | 2.5%                 |                    | :43              | 3.00                 | 1.29             |                                  |                 |                  |
| Pasture . . . . .                                                                                                                                                                                                                                                                                                                                                                                         | .18.5%               |                    | :46              | 5.20                 | 1.55             |                                  |                 |                  |
| Meadow . . . . .                                                                                                                                                                                                                                                                                                                                                                                          | 2.0%                 |                    | :50              | 2.25                 | 1.70             |                                  |                 |                  |
| Roads . . . . .                                                                                                                                                                                                                                                                                                                                                                                           | 1.0%                 |                    | :55              | .96                  | 1.78             |                                  |                 |                  |
| Farmsteads . . . . .                                                                                                                                                                                                                                                                                                                                                                                      | 2.5%                 |                    | 12:00n           | .48                  | 1.82             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :10 p            | .24                  | 1.86             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 6-15-57          | Raingage             | B-10-R           |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    |                  |                      | NR               |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 6-15-57          | Raingage             | B-33-R           |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 10:59a           | 0                    | 0                |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 11:05            | .50                  | .05              |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :11              | 1.30                 | .18              |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :15              | 3.00                 | .38              |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :25              | 1.08                 | .56              |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :35              | 1.62                 | .83              |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :45              | 1.20                 | 1.03             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :55              | 4.08                 | 1.71             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 12:01p           | 1.50                 | 1.86             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :31              | .14                  | 1.93             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 6-15-57          | Raingage             | Met              |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 11:04a           | 0                    | 0                |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 12:34p           |                      | 1.92             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 6-15-57          | Raingage             | B-36-R           |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 11:04a           | 0                    | 0                |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | 1:40p            |                      | 2.09             |                                  |                 |                  |
| Event of June 12, 1958                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    |                  |                      |                  |                                  |                 |                  |
| 5-13-58                                                                                                                                                                                                                                                                                                                                                                                                   | 0.10                 | 0                  | 6-12-58          | Raingage             | B-32-R           | 6-12-58                          |                 |                  |
| 5-14,15                                                                                                                                                                                                                                                                                                                                                                                                   | .64                  | 0                  | 1:54a            | 0                    | 0                | 2:08a                            | 0               | 0                |
| 5-16                                                                                                                                                                                                                                                                                                                                                                                                      | .25                  | 0                  | 2:00             | 1.00                 | .10              | :16                              | .0043           | .0001            |
| 5-26                                                                                                                                                                                                                                                                                                                                                                                                      | .29                  | 0                  | :06              | 3.40                 | .44              | :24                              | .0829           | .0059            |
| 5-27                                                                                                                                                                                                                                                                                                                                                                                                      | .15                  | 0                  | :11              | 6.60                 | .99              | :28                              | .0977           | .0119            |
| 6-6                                                                                                                                                                                                                                                                                                                                                                                                       | .12                  | 0                  | :13              | 1.80                 | 1.05             | :36                              | .0992           | .0250            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :20              | 2.57                 | 1.35             | :38                              | .0940           | .0283            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :25              | .96                  | 1.43             | :45                              | .109            | .0401            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :42              | .18                  | 1.48             | 3:06                             | .127            | .0814            |
|                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | :52              | 0                    | 1.48             | :20                              | .176            | .1166            |
| Notes: To convert runoff in in/hr to cfs, multiply by 485.00. Weighted precipitation of June 15, 1957 event is 1.95 inches by the Thiessen method. The weighted rainfall for the event of June 12, 1958 is 1.69 by the Thiessen method.                                                                                                                                                                   |                      |                    |                  |                      |                  |                                  |                 |                  |
| 1/ This event has been revised and the values shown for this event in Selected Runoff Events for Small Agricultural Watersheds in the United States, A13, SAC, January 1960 (pages 44.1-4 & 5) are to be disregarded. 2/ Beginning of second runoff event of June 15, 1957.                                                                                                                               |                      |                    |                  |                      |                  |                                  |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                    | Hastings, Nebraska Watershed W-3 |                      |                  |                  |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|----------------------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    | Rainfall                         |                      |                  | Runoff           |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                 | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 12, 1958 (continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                    |                                  |                      |                  |                  |                 |                  |
| Watershed Conditions: Fields in corn and sorghum worked between May 14 and June 1. All corn planted by June 1; all sorghum, by June 16. Crops in following condition:<br>Corn - 6" high, poor stand<br>Wheat - 4' high, excellent<br>Oats - 2' high, good condition<br>Alfalfa - cut, excellent condition<br>Meadow - 10" high, good condition<br>Watershed predominantly straight row farmed. The land use in percentage of the watershed area was as follows:<br>Corn . . . . . 15.5%<br>Wheat . . . . . 9.5%<br>Barley . . . . . 1.5%<br>Fallow . . . . . 34.0%<br>Sorghum . . . . . 11.5%<br>Alfalfa . . . . . 1.5%<br>Sudan . . . . . 2.5%<br>Pasture . . . . . 18.5%<br>Meadow . . . . . 2.0%<br>Roads . . . . . 1.0%<br>Farmsteads . . . . . 2.5% |                      |                    | 3:11a                            | .73                  | 1.71             | 3:27a            | .182            | .1375            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 4:44                             | 0                    | 1.71             | :50              | .140            | .2001            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :47                              | 1.60                 | 1.79             | 4:16             | .0509           | .2398            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                                  |                      |                  | :28              | .0394           | .2488            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 6-12-58                          | Rainage              | A-31-R           | 5:00             | .0163           | .2636            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 1:58a                            | 0                    | 0                | 5:28             | .0069           | .2690            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 2:02                             | 3.30                 | .22              | 1:16p            | 0               | .2751            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :13                              | 3.93                 | .94              |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :22                              | 1.87                 | 1.22             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :32                              | .36                  | 1.28             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :56                              | .05                  | 1.30             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 3:16                             | .54                  | 1.48             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 4:46                             | 0                    | 1.43             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :49                              | .60                  | 1.51             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 6-12-58                          | Rain age             | B-10-R           |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 1:52a                            | 0                    | 0                |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 2:02                             | 1.20                 | .20              |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :06                              | 3.00                 | .40              |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :15                              | 4.07                 | 1.10             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :21                              | 2.20                 | 1.32             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :38                              | .42                  | 1.44             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :55                              | 0                    | 1.44             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 3:17                             | .60                  | 1.66             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 4:42                             | 0                    | 1.66             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :46                              | .30                  | 1.68             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 6-12-58                          | Rainage              | Met.             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 1:52a                            | 0                    | 0                |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 5:06                             |                      | 1.84             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 6-12-58                          | Rainage              | B-33-R           |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 1:52a                            | 0                    | 0                |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 3:18                             |                      | 1.52             |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 6-12-58                          | Rainage              | B-36-R           |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 1:49a                            | 0                    | 0                |                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 4:51                             |                      | 1.72             |                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 485.00.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                  |                      |                  |                  |                 |                  |





HASTINGS, NEBRASKA WATERSHED W-3



| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                         |                                           |             |                  |                      |                  |               | Hastings, Nebraska Watershed W-5<br>(Area - 411 acres) |                 |                  |             |           |           |               |      |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------|-------------|------------------|----------------------|------------------|---------------|--------------------------------------------------------|-----------------|------------------|-------------|-----------|-----------|---------------|------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         | Jan.                                      | Feb.        | Mar.             | Apr.                 | May              | June          | July                                                   | Aug.            | Sept.            | Oct.        | Nov.      | Dec.      | Year          |      |      |
| 1956                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | P<br>Q                  | 0.24<br>0                                 | 0.20<br>0   | 0.28<br>0        | 0.92<br>T            | 0.82<br>0        | 4.24<br>.40   | 2.81<br>.18                                            | 1.46<br>.02     | 1.19<br>.01      | 0.68<br>.01 | 0.23<br>0 | 0.05<br>0 | 13.12<br>.62  |      |      |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | P<br>Q                  | .17<br>0                                  | .17<br>0    | 2.35<br>.01      | 3.05<br>.11          | 7.42<br>1.13     | 11.98<br>5.28 | .20<br>0                                               | 5.27<br>.70     | .41<br>0         | 1.27<br>0   | .60<br>0  | .18<br>0  | 33.07<br>7.23 |      |      |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | P<br>Q                  | .12<br>0                                  | 1.28<br>.01 | 2.43<br>.30      | 2.01<br>.13          | 1.40<br>0        | 3.59<br>.38   | 5.02<br>.25                                            | 3.58<br>.13     | 1.62<br>T        | .20<br>0    | .52<br>0  | .04<br>0  | 21.81<br>1.20 |      |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | P<br>Q                  | .23<br>0                                  | .31<br>.02  | 3.68<br>.20      | .99<br>.01           | 7.31<br>1.27     | 4.73<br>.62   | 2.68<br>1.36                                           | 3.80<br>.46     | 4.52<br>.36      | 2.09<br>.07 | T<br>0    | .09<br>0  | 30.43<br>4.37 |      |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                                           |             |                  |                      |                  |               | Hastings, Nebraska Watershed W-5                       |                 |                  |             |           |           |               |      |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | MAXIMUM DISCHARGE       | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |             |                  |                      |                  |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         | 1 hour                                    |             | 2 hours          |                      | 6 hours          |               | 12 hours                                               |                 | 1 day            |             | 2 days    |           | 8 days        |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Date                    | Rate                                      | Date        | Vol.             | Date                 | Vol.             | Date          | Vol.                                                   | Date            | Vol.             | Date        | Vol.      | Date      | Vol.          | Date | Vol. |
| 1956 1/                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6-26                    | 0.14                                      | 6-26        | 0.12             | 6-26                 | 0.19             | 6-25          | 0.24                                                   | 6-25            | 0.25             | 6-25        | 0.25      | 6-25      | 0.35          | 6-25 | 0.56 |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 6-15                    | .92                                       | 6-15        | .73              | 6-15                 | 1.27             | 6-15          | 2.77                                                   | 6-15            | 3.15             | 6-15        | 3.45      | 6-15      | 4.95          | 6-13 | 4.98 |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 6-12                    | .32                                       | 6-12        | .22              | 6-12                 | .30              | 6-12          | .34                                                    | 6-12            | .35              | 6-12        | .37       | 6-12      | .38           | 6-12 | .38  |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 7-3                     | 1.15                                      | 7-3         | .93              | 7-3                  | 1.20             | 7-3           | 1.34                                                   | 7-3             | 1.36             | 7-3         | 1.36      | 7-3       | 1.36          | 6-27 | 1.80 |
| Notes: Quality of records: Precipitation and runoff, good to excellent except the winter months of Dec., Jan., Feb. & March which are fair to good. Watershed Conditions: 1956 - crops and cover, poor; 1957 - meadow and pasture good to excellent; wheat, good; sorghum replanted after June 15th storm; crops, good. 1958 and 1959 - crops fair at beginning of season; good to excellent at harvest time. 1956 values are revised and supersede those previously reported.                                                                                                                                                                                                                                                                                 |                         |                                           |             |                  |                      |                  |               |                                                        |                 |                  |             |           |           |               |      |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                                           |             |                  |                      |                  |               | Hastings, Nebraska Watershed W-5                       |                 |                  |             |           |           |               |      |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         |                                           |             | Rainfall         |                      |                  |               | Runoff                                                 |                 |                  |             |           |           |               |      |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Rainfall 2/<br>(inches) | Runoff<br>(inches)                        |             | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) |               | Date and<br>time                                       | Rate<br>(in/hr) | Acc.<br>(inches) |             |           |           |               |      |      |
| Event of May 29 and 30, 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                         |                                           |             |                  |                      |                  |               |                                                        |                 |                  |             |           |           |               |      |      |
| 4-30-57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.24                    | 0                                         |             | 5-29-57          | Rainage              | C-45-P           |               | 5-29-57                                                |                 |                  |             |           |           |               |      |      |
| 5-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.38                    | .30                                       |             | 4:17p            | 0                    | 0                |               | 4:20p                                                  | 0               | 0                |             |           |           |               |      |      |
| 5-9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.65                    | .13                                       |             | :22              | 1.92                 | .16              |               | :16                                                    |                 | .0111            |             |           |           | .0003         |      |      |
| 5-11,12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .41                     | .01                                       |             | :27              | .60                  | .21              |               | :32                                                    |                 | .0468            |             |           |           | .0028         |      |      |
| 5-13,14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.58                    | .40                                       |             | :34              | 3.17                 | .58              |               | :38                                                    |                 | .159             |             |           |           | .0135         |      |      |
| 5-15,16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .94                     | .12                                       |             | :37              | 2.20                 | .69              |               | :44                                                    |                 | .159             |             |           |           | .0294         |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :47              | 1.14                 | .88              |               | :50                                                    |                 | .143             |             |           |           | .0445         |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :52              | .36                  | .91              |               | 5:10                                                   |                 | .0668            |             |           |           | .0788         |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | 6:12             | .04                  | .96              |               | :40                                                    |                 | .0328            |             |           |           | .1030         |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             |                  |                      |                  |               | 6:00                                                   |                 | .0204            |             |           |           | .1215         |      |      |
| Watershed Conditions: Corn just planted, wheat was heading out and about 36" high and in excellent condition. Sorghum just planted; pasture in excellent condition about 10" high. Meadow about 12" high, heading out and in excellent condition. Alfalfa in good condition and ready to cut. 90% of cultivation on the contour; 10% straight row. The land use in percentage of the watershed area was as follows:<br>Corn . . . . . 6.0%<br>Oats . . . . . 1.0%<br>Wheat . . . . . 5.5%<br>Fallow . . . . . 23.5%<br>Sorghum . . . . . 25.0%<br>Alfalfa . . . . . 7.0%<br>Sweet Clover . . . . . 2.0%<br>Sudan . . . . . .5%<br>Brome . . . . . 7.0%<br>Pasture . . . . . 10.0%<br>Meadow . . . . . 9.5%<br>Roads . . . . . .5%<br>Farmsteads . . . . . 2.5% |                         |                                           |             | 5-29-57          | Rainage              | D-45-R           | :23           | .0111                                                  | .1300           |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | 4:10p            | 0                    | 0                | 7:30          | .0052                                                  | .1354           |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :16              | .50                  | .05              | 5-30-57       |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :19              | 1.60                 | .13              | 12:00n        | 0                                                      | .1469           |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :24              | 4.80                 | .53              |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :26              | 6.30                 | .74              |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :30              | 3.60                 | .98              |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :34              | 2.10                 | 1.12             |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :38              | 1.05                 | 1.19             |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | 5:54             | .06                  | 1.26             |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | 5-29-57          | Rainage              | D-50-R           |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | 4:16p            | 0                    | 0                |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :24              | .37                  | .05              |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :27              | 3.00                 | .20              |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :32              | 6.36                 | .73              |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :34              | 5.10                 | .90              |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :36              | 3.90                 | 1.03             |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :44              | 1.88                 | 1.28             |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | :58              | .30                  | 1.35             |               |                                                        |                 |                  |             |           |           |               |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                           |             | 5:18             | .09                  | 1.38             |               |                                                        |                 |                  |             |           |           |               |      |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 44.4.<br>Weighted precipitation for the event of May 29 and 30, 1957 is 1.11 inches by the Thiessen method.<br>2/ All antecedent rainfall is weighted using the Thiessen method.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                                           |             |                  |                      |                  |               |                                                        |                 |                  |             |           |           |               |      |      |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed W-5 |                 |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 15, 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                  |                      |                  |                                  |                 |                  |
| 5-15-57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.93                 | 0.12               | 6-15-57          | Rainage              | C-45-R           | 6-15-57                          |                 |                  |
| 5-29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.11                 | .15                | 11:08a           | 0                    | 0                | 11:20a                           | 0               | 0                |
| 5-31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | .36                  | .03                | :11              | 1.80                 | .09              | :22                              | .0014           | T                |
| 6-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .10                  | 0                  | :13              | 3.60                 | .21              | :30                              | .0335           | .0026            |
| 6-10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | .54                  | 0                  | :16              | 2.00                 | .31              | :40                              | .0635           | .0107            |
| 6-13,14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .93                  | .03                | :28              | 1.60                 | .63              | :55                              | .0656           | .0268            |
| Watershed Conditions: The wheat was fully headed, about 4' high and in excellent condition. The sorghum was not out of the ground. Pasture was in excellent condition at a height of 12". Meadow was in excellent condition, heading out, at about 14" inches in height. About 90% of cultivation was contour and 10% straight row. The land use in percentage of the watershed area was as follows:<br>Corn . . . . . 6.0%<br>Oats . . . . . 1.0%<br>Wheat . . . . . 5.5%<br>Fallow . . . . . 23.5%<br>Sorghum . . . . . 25.0%<br>Alfalfa . . . . . 7.0%<br>Sweet Clover . . . . . 2.0%<br>Sudan . . . . . .5%<br>Brome . . . . . 7.0%<br>Pasture . . . . . 10.0%<br>Meadow . . . . . 9.5%<br>Roads . . . . . .5%<br>Farmsteads . . . . . 2.5% |                      |                    | :32              | .75                  | .68              | 12:00n                           | .0591           | .0320            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :35              | 2.20                 | .79              | :04p                             | .0591           | .0360            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :52              | .46                  | .92              | :20                              | .203            | .0693            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :54              | 1.50                 | .97              | :30                              | .244            | .1065            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | 11:56            | 3.90                 | 1.10             | :45                              | .270            | .1708            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | 12:00n           | 2.10                 | 1.24             | :55                              | .270            | .2158            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :04p             | 1.50                 | 1.34             | 1:00                             | .223            | .2363            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :08              | .45                  | 1.37             | :20                              | .114            | .2925            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | 1:18             | .03                  | 1.40             | :40                              | .0668           | .3227            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | 6-15-57          | Rainage              | D-45-R           | 2:00                             | .0451           | .3413            |
| 11:02a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                    | 0                  | :30              | .0277                | .3595            |                                  |                 |                  |
| :11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .20                  | .03                | 4:00             | .0087                | .3845            |                                  |                 |                  |
| :15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.40                 | .19                | 5:10 1/          | .0055                | .3927            |                                  |                 |                  |
| :30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.50                 | .55                |                  |                      |                  |                                  |                 |                  |
| :35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .48                  | .59                |                  |                      |                  |                                  |                 |                  |
| :38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.20                 | .70                |                  |                      |                  |                                  |                 |                  |
| :47                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .67                  | .80                |                  |                      |                  |                                  |                 |                  |
| :57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .06                  | .81                |                  |                      |                  |                                  |                 |                  |
| 12:08p                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.42                 | 1.07               |                  |                      |                  |                                  |                 |                  |
| 1:08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | .01                  | 1.08               |                  |                      |                  |                                  |                 |                  |
| 6-15-57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Rainage              | D-50-R             |                  |                      |                  |                                  |                 |                  |
| 10:40a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                    | 0                  |                  |                      |                  |                                  |                 |                  |
| :09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .10                  | .05                |                  |                      |                  |                                  |                 |                  |
| :12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.40                 | .12                |                  |                      |                  |                                  |                 |                  |
| :14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.90                 | .25                |                  |                      |                  |                                  |                 |                  |
| :16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .60                  | .27                |                  |                      |                  |                                  |                 |                  |
| :29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.85                 | .67                |                  |                      |                  |                                  |                 |                  |
| :33                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .45                  | .70                |                  |                      |                  |                                  |                 |                  |
| :37                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.80                 | .82                |                  |                      |                  |                                  |                 |                  |
| :41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .45                  | .85                |                  |                      |                  |                                  |                 |                  |
| :45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.05                 | .92                |                  |                      |                  |                                  |                 |                  |
| :55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .12                  | .94                |                  |                      |                  |                                  |                 |                  |
| :58                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.40                 | 1.11               |                  |                      |                  |                                  |                 |                  |
| 12:03p                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.68                 | 1.25               |                  |                      |                  |                                  |                 |                  |
| :08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | .60                  | 1.30               |                  |                      |                  |                                  |                 |                  |
| 2:08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | .01                  | 1.32               |                  |                      |                  |                                  |                 |                  |
| Event of June 12, 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                  |                      |                  |                                  |                 |                  |
| 5-13,14-58                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.17                 | 0                  | 6-12-58          | Rainage              | C-45-R           | 6-12-58                          |                 |                  |
| 5-15,16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .40                  | 0                  | 1:50a            | 0                    | 0                | 1:56a                            | 0               | 0                |
| 5-16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | .20                  | 0                  | :54              | .60                  | .04              | 2:06                             | .0003           | T                |
| 5-19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | .10                  | 0                  | 2:00             | 2.20                 | .16              | :08                              | .0111           | .0002            |
| 5-26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | .31                  | 0                  | :04              | 2.55                 | .33              | :12                              | .114            | .0047            |
| Watershed Conditions: Corn was 5" high, poor stand; wheat, 4' high, turning and in excellent condition. Sorghum planted about June 1. Meadow in good condition. Pasture 6" high and in good condition. Summer fallow ground all worked within two weeks preceding June 12th storm.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |                    | :06              | 4.80                 | .49              | :20                              | .203            | .0270            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :11              | 10.44                | 1.36             | :34                              | .130            | .0659            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :16              | 3.96                 | 1.69             | :42                              | .171            | .0859            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :21              | 2.76                 | 1.92             | :50                              | .282            | .1169            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :37              | .45                  | 2.04             | :56                              | .323            | .1472            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :49              | .00                  | 2.04             | 3:04                             | .290            | .1881            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | 3:10             | .54                  | 2.23             | :20                              | .159            | .2478            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | 4:43             | .00                  | 2.23             | :30                              | .101            | .2694            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | :48              | .24                  | 2.25             | :42                              | .0729           | .2868            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | 4:20                             | .0306           | .3189            |
| 6-12-58                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Rainage              | D-45-R             | 5:00             | .0119                | .3331            |                                  |                 |                  |
| 1:48a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0                    | 0                  | :42              | .0052                | .3391            |                                  |                 |                  |
| 2:00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | .50                  | .10                | 3:08p            | 0                    | .3470            |                                  |                 |                  |
| Notes: Weighted precipitation for the event of June 15, 1957 is 1.37 inches by the Thiessen method. The weighted precipitation for the event of June 12, 1958 is 2.21 inches by the Thiessen method. 1/ Beginning of second runoff event of June 15, 1957.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                  |                      |                  |                                  |                 |                  |

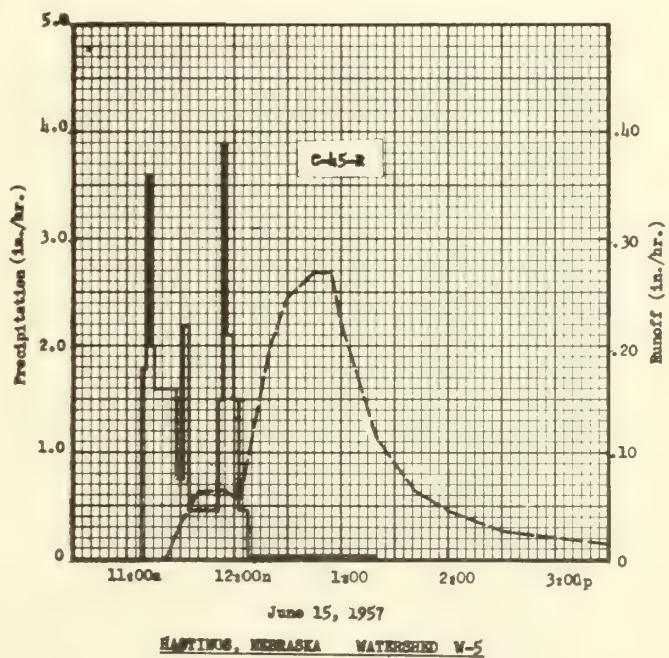
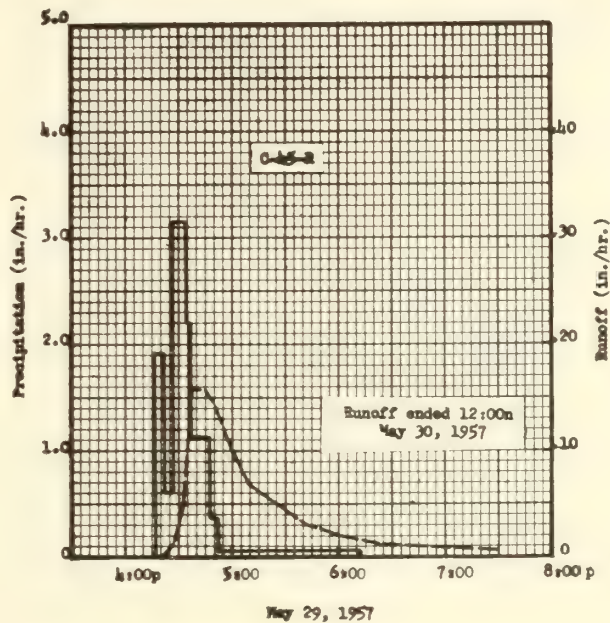
Notes: Weighted precipitation for the event of June 15, 1957 is 1.37 inches by the Thiessen method. The weighted precipitation for the event of June 12, 1958 is 2.21 inches by the Thiessen method. 1/ Beginning of second runoff event of June 15, 1957.

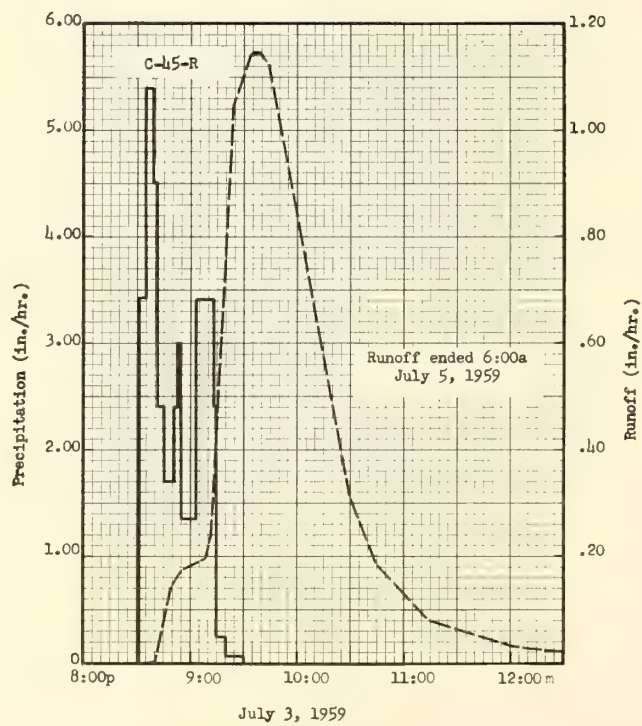
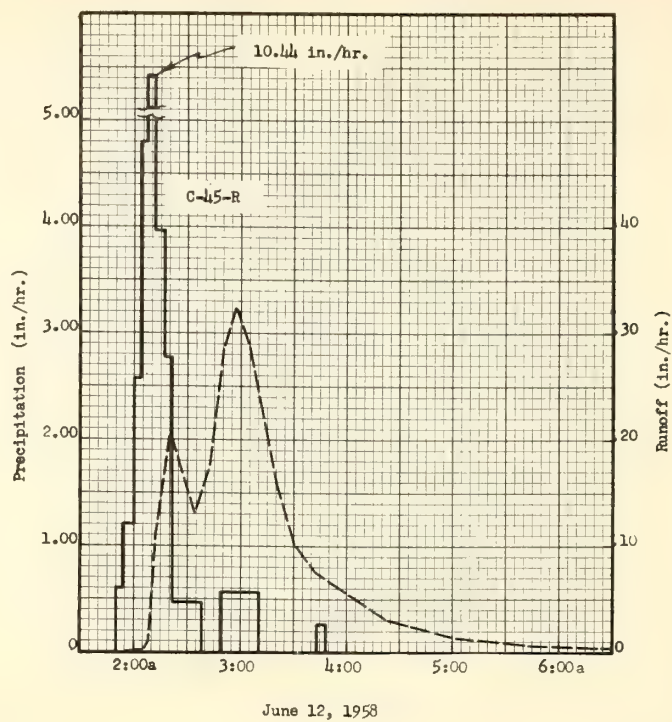


| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed W-5 |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 12, 1958 (continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  |                                  |                 |                  |
| The land use in percentage of the watershed area was as follows:<br>Corn . . . . . 9.5%<br>Oats . . . . . 3.0%<br>Wheat . . . . . 19.0%<br>Fallow . . . . . 9.0%<br>Sorghum . . . . . 13.5%<br>Alfalfa . . . . . 11.0%<br>Sudan . . . . . .5%<br>Pasture . . . . . 14.0%<br>Meadow . . . . . 17.0%<br>Roads . . . . . .5%<br>Farmsteads . . . . . 3.0%                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                    | 2:06 a           | 2.70                 | .37              |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :16              | 6.72                 | 1.49             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :20              | 2.85                 | 1.68             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :34              | .94                  | 1.90             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :48              | 0                    | 1.90             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 3:07             | .54                  | 2.07             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 4:46             | 0                    | 2.07             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :48              | 2.10                 | 2.14             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 6-12-58          | Raingage             | D-50-R           |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 1:56a            | 0                    | 0                |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 2:00             | 1.20                 | .08              |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :06              | 2.20                 | .30              |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :13              | 6.86                 | 1.10             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :20              | 4.46                 | 1.62             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :30              | 1.08                 | 1.80             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 3:02             | .39                  | 2.01             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :08              | .90                  | 2.10             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 4:44             | 0                    | 2.10             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :48              | .30                  | 2.12             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 9:24             | 0                    | 2.12             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :28              | .30                  | 2.14             |                                  |                 |                  |
| Event of July 3-5, 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                    |                  |                      |                  |                                  |                 |                  |
| 6-18-59                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | T                    | 0                  | 7-3-59           | Raingage             | C-45-R           | 7-3-59                           |                 |                  |
| 6-19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | .54                  | 0                  | 8:31p            | 0                    | 0                | 8:36p                            | 0               | 0                |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.40                 | .18                | :35              | 3.45                 | .23              | :40                              | .0002           | T                |
| 6-27,28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.85                 | .40                | :39              | 5.40                 | .59              | :50                              | .145            | .0131            |
| 6-29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | .25                  | .01                | :41              | 4.50                 | .74              | :54                              | .171            | .0237            |
| 6-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | .29                  | .02                | :45              | 2.40                 | .90              | 9:08                             | .199            | .0673            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :51              | 1.70                 | 1.07             | :12                              | .244            | .0816            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :53              | 2.40                 | 1.15             | :24                              | 1.05            | .2255            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :55              | 3.00                 | 1.25             | :34                              | 1.15            | .4098            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 9:03             | 1.35                 | 1.43             | :38                              | 1.15            | .4864            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :13              | 3.42                 | 2.00             | :44                              | 1.13            | .6004            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :15              | 2.40                 | 2.08             | 10:29                            | .314            | 1.1377           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :20              | .24                  | 2.10             | :44                              | .194            | 1.1999           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :30              | .06                  | 2.11             | 11:14                            | .0820           | 1.2662           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                  |                      |                  | 12:00m                           | .0335           | 1.3076           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 7-3-59           | Raingage             | D-45-R           | 7-4-59                           |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 8:30p            | 0                    | 0                | 12:20a                           | .0239           | 1.3172           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :35              | .84                  | .07              | 2:30                             | .0052           | 1.3433           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :37              | 4.20                 | .21              | 10:30p                           | T               | 1.3583           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :43              | 5.40                 | .75              | 7-5-59                           |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :47              | 3.60                 | .99              | 6:00a                            | 0               | 1.3583           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :58              | 2.56                 | 1.46             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 9:02             | 1.50                 | 1.56             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :17              | 3.20                 | 2.36             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :21              | .75                  | 2.41             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | :41              | .15                  | 2.46             |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    | 7-3-59           | Raingage             | D-50-R           |                                  |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                  | nr                   | 2.00             |                                  |                 |                  |
| Watershed Conditions: Corn was 1' high, thin stand and in poor condition. Wheat was 3-4' high, ripe and in good condition. Sorghum was 6" high, with a good stand. Oats 2' high, thin stand. Alfalfa, first cutting out, 2nd growth about 4" high. Meadow 8" high and in good condition. Most of fallow ground had been plowed before the storm. The watershed is predominantly contour farmed. The land use in percentage of the watershed area was as follows:<br>Corn . . . . . 5.5%<br>Oats . . . . . 2.0%<br>Wheat . . . . . 18.0%<br>Fallow . . . . . 12.0%<br>Sorghum . . . . . 17.0%<br>Alfalfa . . . . . 7.0%<br>Sudan . . . . . 1.0%<br>Pasture . . . . . 13.0%<br>Meadow . . . . . 21.0%<br>Roads . . . . . 1.0%<br>Farmsteads . . . . . 2.5% |                      |                    |                  |                      |                  |                                  |                 |                  |

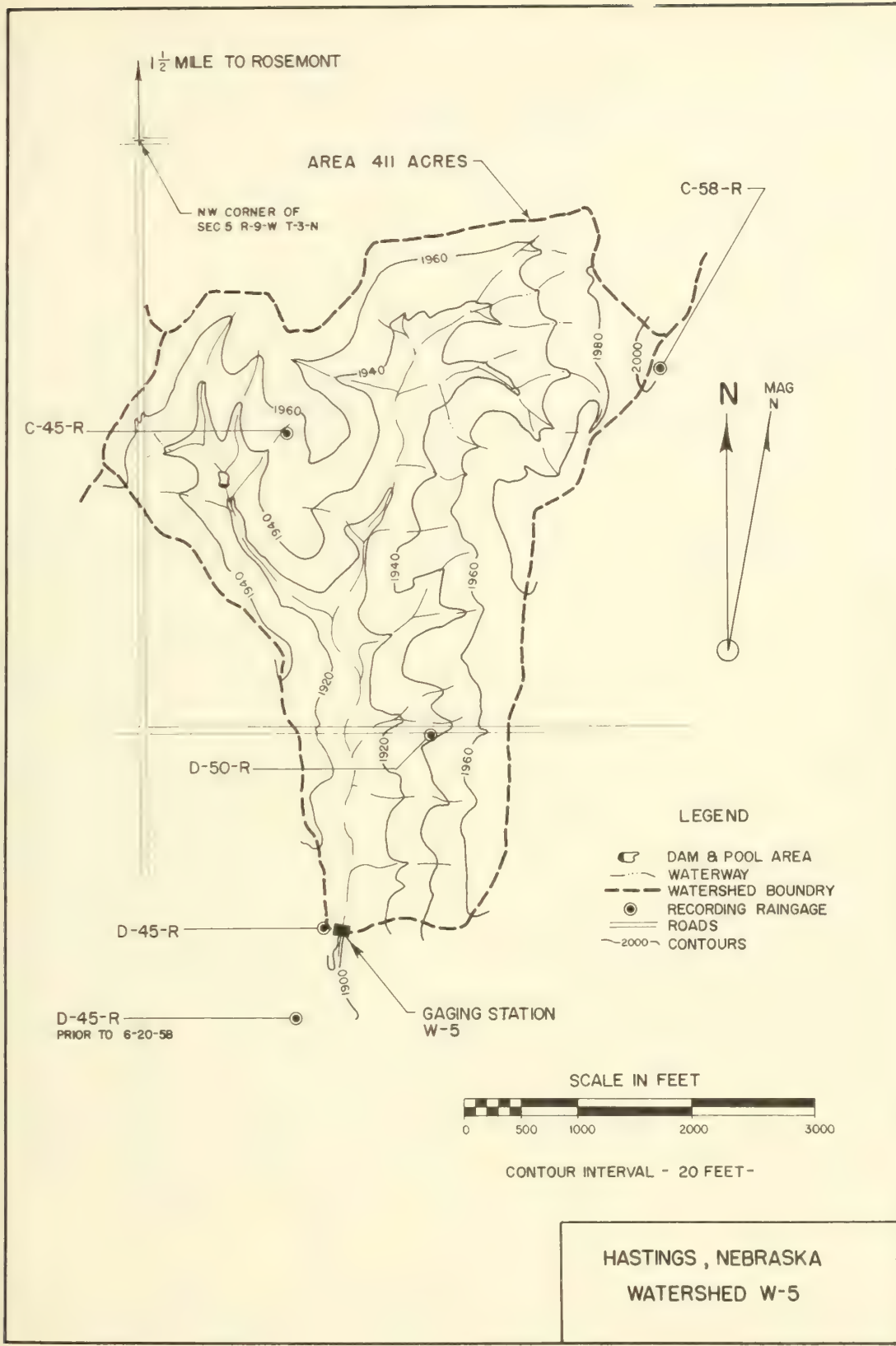
## Notes:

The weighted rainfall for the event of July 3-5, 1959 is 2.10 inches by the Thiessen method.





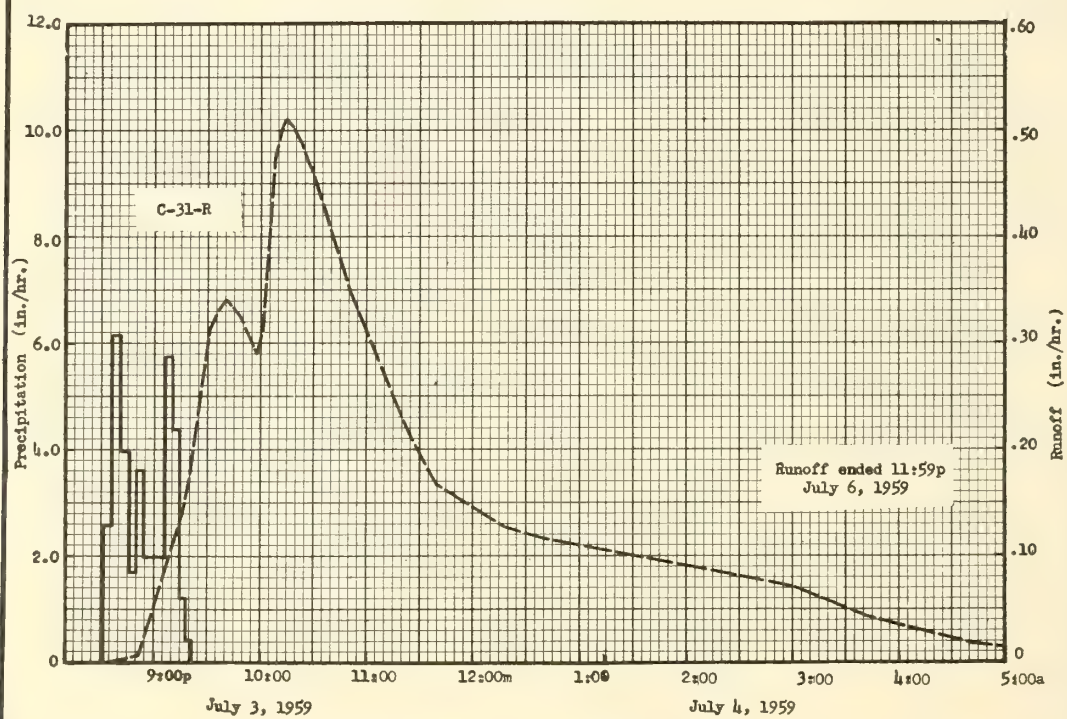
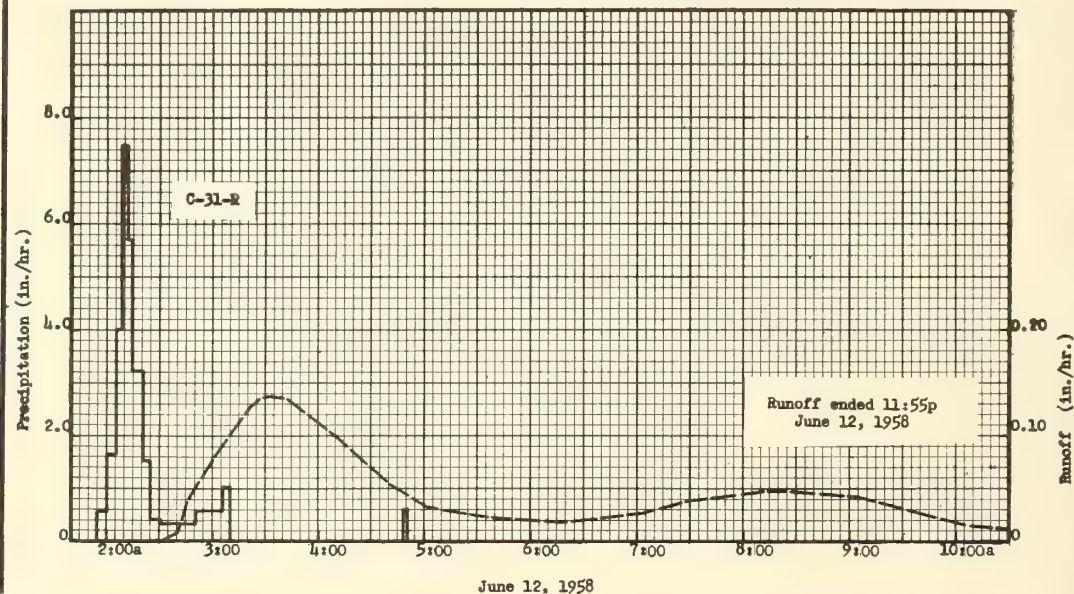
HASTINGS, NEBRASKA, WATERSHED W-5





| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |         |                                           |               |                   |               |               | Hastings, Nebraska Watershed W-8<br>Area - 2086 acres (3.259 sq. mi.) |               |       |       |       |        |       |        |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|-------------------------------------------|---------------|-------------------|---------------|---------------|-----------------------------------------------------------------------|---------------|-------|-------|-------|--------|-------|--------|-------|
| Year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Month                | Jan.    | Feb.                                      | Mar.          | Apr.              | May           | June          | July                                                                  | Aug.          | Sept. | Oct.  | Nov.  | Dec.   | Year  |        |       |
| 1956                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | P                    | 0.23    | 0.16                                      | 0.26          | 1.06              | 0.73          | 3.89          | 2.81                                                                  | 1.54          | 1.18  | 0.71  | 0.09  | 0.04   | 12.70 |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Q                    | 0       | .05                                       | 0             | 0                 | 0             | .58           | .29                                                                   | .10           | .01   | T     | 0     | 0      | 1.03  |        |       |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | P                    | .15     | .05                                       | 1.82          | 2.99              | 6.94          | 11.70         | .20                                                                   | 5.45          | .47   | 1.31  | .58   | .21    | 31.87 |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Q                    | 0       | 0                                         | T             | .29               | 1.82          | 5.55          | 0                                                                     | 1.41          | 0     | 0     | 0     | 0      | 9.07  |        |       |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | P                    | .10     | 1.37                                      | 2.51          | 1.86              | 1.41          | 3.27          | 4.71                                                                  | 3.68          | 1.71  | .07   | .48   | .05    | 21.22 |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Q                    | 0       | T                                         | .24           | .07               | 0             | .44           | .34                                                                   | .36           | .01   | 0     | 0     | 0      | 1.46  |        |       |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | P                    | .30     | .34                                       | 3.70          | .91               | 6.26          | 4.80          | 2.96                                                                  | 3.43          | 4.60  | 2.00  | T     | .07    | 29.37 |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Q                    | 0       | .08                                       | .13           | .03               | .75           | .82           | 1.28                                                                  | .07           | .63   | .08   | 0     | 0      | 3.87  |        |       |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                                                                                                                                     |                      |         |                                           |               |                   |               |               | Hastings, Nebraska Watershed W-8                                      |               |       |       |       |        |       |        |       |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | MAXIMUM DISCHARGE    |         | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | 1 hour                                    |               | 2 hours           |               | 6 hours       |                                                                       | 12 hours      |       | 1 day |       | 2 days |       | 8 days |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Date                 | Rate    | Date                                      | Vol.          | Date              | Vol.          | Date          | Vol.                                                                  | Date          | Vol.  | Date  | Vol.  | Date   | Vol.  | Date   | Vol.  |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6-12                 | e .14   | 6-12                                      | e .12         | 6-12              | e .20         | 6-12          | e .32                                                                 | 6-12          | e .38 | 6-12  | e .40 | 6-12   | e .42 | 6-12   | e .44 |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7-3                  | .51     | 7-3                                       | .42           | 7-3               | .71           | 7-3           | 1.17                                                                  | 7-3           | 1.27  | 7-3   | 1.27  | 7-3    | 1.28  | 6-28   | 1.84  |
| Notes: Quality of Records: Monthly P - excellent except Dec., Jan., Feb. and Mar. which were fair to good; monthly Q, annual maximum discharges & volumes, fair. Watershed Conditions: Mixed cover watershed with about 64% in cultivation, 24% in native grass, 8% in alfalfa and 4% in roads and farmsteads. Cultivated area was almost all straight-row farmed with a wheat, corn, sorghum & fallow rotation. All crops poor in 1956 and good to excellent in 1957, 1958 and 1959. e - estimated or partially estimated. |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |         |                                           |               |                   |               |               | Hastings, Nebraska Watershed W-8                                      |               |       |       |       |        |       |        |       |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |         |                                           | Rainfall      |                   |               |               | Runoff                                                                |               |       |       |       |        |       |        |       |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Rainfall 1/ (inches) |         | Runoff (inches)                           | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr)                                                          | Acc. (inches) |       |       |       |        |       |        |       |
| Event of June 12, 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| 5-13,14-57                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .35                  | 0       | 6-12-58                                   | Rainage       | C-31-R            | 6-12-58       |               |                                                                       |               |       |       |       |        |       |        |       |
| 5-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .29                  | 0       | 1:54a                                     | 0             | 0                 | 2:16a         | 0             | 0                                                                     |               |       |       |       |        |       |        |       |
| 5-16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .27                  | T       | 2:00                                      | .60           | .06               | :30           | .0012         | .0001                                                                 |               |       |       |       |        |       |        |       |
| 5-26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .28                  | 0       | :05                                       | 1.68          | .20               | :40           | .0082         | .0006                                                                 |               |       |       |       |        |       |        |       |
| 5-27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .14                  | 0       | :08                                       | 4.00          | .40               | :45           | .0362         | .0026                                                                 |               |       |       |       |        |       |        |       |
| 6-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .12                  | 0       | :12                                       | 7.50          | .90               | :49           | .0491         | .0055                                                                 |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | :14                                       | 5.70          | 1.09              | 3:02          | .0812         | .0199                                                                 |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | :20                                       | 3.20          | 1.41              | :20           | .126          | .0516                                                                 |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | :24                                       | 1.50          | 1.51              | :26           | .134          | .0646                                                                 |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | :30                                       | .40           | 1.55              | :33           | .136          | .0803                                                                 |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | :50                                       | .18           | 1.61              | :42           | .133          | .1005                                                                 |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | 3:05                                      | .56           | 1.75              | 4:10          | .0983         | .1552                                                                 |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | :09                                       | 1.05          | 1.82              | :30           | .0694         | .1831                                                                 |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | 4:48                                      | .01           | 1.83              | :41           | .0522         | .1943                                                                 |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         | :50                                       | .60           | 1.85              | 5:01          | .0320         | .2079                                                                 |               |       |       |       |        |       |        |       |
| Watershed Conditions:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Corn - 6" high, poor stand.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Wheat - 4" high, excellent condition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Oats - 2" high, good condition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Sorghum - 2" high, poor stand.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Alfalfa - cut, excellent condition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Meadow - 10" high, good condition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Pasture - 6" high, good condition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Fields in corn and sorghum worked between May 14 and June 1. All corn planted by June 1, all sorghum planted by June 12. Watershed predominantly straight row farmed. The land use (partly estimated) in percentage of the watershed area was as follows:                                                                                                                                                                                                                                                                   |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Corn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 11%                  | :32     | .36                                       | 1.28          | :25               | .0495         | .3099         |                                                                       |               |       |       |       |        |       |        |       |
| Wheat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 14%                  | :56     | .05                                       | 1.30          | 9:06              | .0407         | .3415         |                                                                       |               |       |       |       |        |       |        |       |
| Oats                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1%                   | 3:08    | .25                                       | 1.35          | 10:06             | .0166         | .3693         |                                                                       |               |       |       |       |        |       |        |       |
| Sorghum in rows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 15%                  | :11     | 1.80                                      | 1.44          | 11:06             | .0044         | .3775         |                                                                       |               |       |       |       |        |       |        |       |
| Fallow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 19%                  | :16     | .48                                       | 1.48          | 1:06p             | .0016         | .3827         |                                                                       |               |       |       |       |        |       |        |       |
| Sudan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1%                   |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Alfalfa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 9%                   | 4:46    | 0                                         | 1.48          | 11:55 2/          | .0002         | .3884         |                                                                       |               |       |       |       |        |       |        |       |
| Clover                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2%                   | :49     | .60                                       | 1.51          |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Meadow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3%                   |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Pasture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 21%                  | 6-12-58 | Rainage                                   | B-32-R        |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Farmsteads                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2%                   | 1:54a   | 0                                         | 0             |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Roads                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2%                   | 2:00    | 1.00                                      | .10           |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      | :04     | 2.85                                      | .29           |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      | :08     | 4.80                                      | .61           |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |
| Notes: To convert runoff in in/hr to cfs, multiply by 2103. Weighted precipitation for event of 6-12-58 is 1.85 inches by the Thiessen method. 1/ All antecedent rainfall is weighted using Thiessen method. 2/ Beginning of new storm. For map of watershed, refer to page 44.4-8.                                                                                                                                                                                                                                         |                      |         |                                           |               |                   |               |               |                                                                       |               |       |       |       |        |       |        |       |

| SELECTED RUNOFF EVENTS                                                                                                          |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed W-6 |                 |                  |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                           |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                                            | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 12, 1958 (continued)                                                                                              |                      |                    |                  |                      |                  |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 2:11a            | 7.60                 | .99              |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :20              | 2.40                 | 1.35             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :25              | .96                  | 1.43             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :42              | .18                  | 1.48             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :52              | 0                    | 1.48             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 3:11             | .73                  | 1.71             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 4:44             | 0                    | 1.71             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :47              | 1.60                 | 1.79             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 6-12-58          | Raingage             | D-31-R           |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 1:56a            | 0                    | 0                |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 2:00             | 1.35                 | .09              |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :03              | .20                  | .10              |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :09              | 2.00                 | .30              |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :14              | 7.68                 | .94              |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :20              | 5.20                 | 1.46             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :28              | 2.55                 | 1.80             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :35              | .86                  | 1.90             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :44              | .27                  | 1.94             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :49              | 0                    | 1.94             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 3:02             | .65                  | 2.08             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :06              | 1.80                 | 2.20             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :10              | .30                  | 2.22             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 4:47             | 0                    | 2.22             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | :50              | .48                  | 2.26             |                                  |                 |                  |
| Event of July 3-4, 1959                                                                                                         |                      |                    |                  |                      |                  |                                  |                 |                  |
| 6-18-59                                                                                                                         | .03                  |                    | 7-3-59           | Raingage             | C-31-R           | 7-3-59                           |                 |                  |
| 6-19                                                                                                                            | .55                  |                    | 8:32p            | 0                    | 0                | 8:35p                            | 0               | 0                |
| 6-20, 21                                                                                                                        | 1.26                 | .22                | :36              | 2.55                 | .17              | :52                              | .0077           | .0005            |
| 6-27, 28                                                                                                                        | 1.83                 | .53                | :41              | 6.12                 | .68              | 9:16                             | .142            | .0309            |
| 6-29, 30                                                                                                                        | .43                  | .03                | :46              | 3.96                 | 1.01             | :20                              | .178            | .0416            |
|                                                                                                                                 |                      |                    | :50              | 1.65                 | 1.12             | :32                              | .316            | .0908            |
|                                                                                                                                 |                      |                    | :54              | 3.60                 | 1.36             | :36                              | .332            | .1121            |
|                                                                                                                                 |                      |                    | :06              | 1.95                 | 1.75             | :40                              | .342            | .1348            |
|                                                                                                                                 |                      |                    | :10              | 5.70                 | 2.13             | :48                              | .326            | .1795            |
|                                                                                                                                 |                      |                    | :11              | 4.35                 | 2.42             | :58                              | .290            | .2305            |
|                                                                                                                                 |                      |                    | :18              | 1.20                 | 2.50             | 10:00                            | .209            | .2406            |
|                                                                                                                                 |                      |                    | :22              | .45                  | 2.53             | :08                              | .473            | .2934            |
|                                                                                                                                 |                      |                    | 7-4-59           |                      |                  |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 12:00n           | T                    | 2.57             | :12                              | .501            | .3259            |
|                                                                                                                                 |                      |                    | 7-3-59           | Raingage             | A-31-R           | :11                              | .510            | .3427            |
|                                                                                                                                 |                      |                    | 8:31p            | 0                    | 0                | :13                              | .601            | .3764            |
|                                                                                                                                 |                      |                    | :40              | 6.47                 | .97              | :28                              | .465            | .4571            |
|                                                                                                                                 |                      |                    | :44              | 4.20                 | 1.25             | :52                              | .6197           | .6197            |
|                                                                                                                                 |                      |                    | :49              | 2.44                 | 1.47             | 11:24                            | .349            | .7691            |
|                                                                                                                                 |                      |                    | :52              | 1.40                 | 1.54             | :40                              | .217            | .8216            |
|                                                                                                                                 |                      |                    | 9:02             | 2.34                 | 1.93             | 7-4-59                           | .126            |                  |
|                                                                                                                                 |                      |                    | :13              | 1.80                 | 2.26             | 12:20a                           | .117            | .9165            |
|                                                                                                                                 |                      |                    | :17              | .75                  | 2.31             | :40                              | .0703           | .9570            |
|                                                                                                                                 |                      |                    | :37              | .06                  | 2.32             | 3:00                             | 1.1758          | 1.1758           |
|                                                                                                                                 |                      |                    |                  |                      |                  | :40                              | .0443           | 1.2149           |
|                                                                                                                                 |                      |                    | 7-3-59           | Raingage             | B-32-R           | 4:40                             | .0189           | 1.2442           |
|                                                                                                                                 |                      |                    | 8:32p            | 0                    | 0                | 5:20                             | .0110           | 1.2541           |
|                                                                                                                                 |                      |                    | :44              | 5.75                 | 1.15             | 11:00                            | .0010           | 1.2721           |
|                                                                                                                                 |                      |                    | 9:02             | 2.13                 | 1.79             | 12:00n                           | .0001           | 1.2763           |
|                                                                                                                                 |                      |                    | :06              | 2.70                 | 1.97             | 7-5-59                           |                 |                  |
|                                                                                                                                 |                      |                    | :10              | 3.75                 | 2.22             | 12:00n                           | T               | 1.2773           |
|                                                                                                                                 |                      |                    | :11              | 2.70                 | 2.40             | 7-6-59                           |                 |                  |
|                                                                                                                                 |                      |                    | :17              | .80                  | 2.44             | 11:59p                           | 0               | 1.2773           |
|                                                                                                                                 |                      |                    | :25              | .15                  | 2.46             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 7-4-59           |                      |                  |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 3:00p            | T                    | 2.48             |                                  |                 |                  |
|                                                                                                                                 |                      |                    | 7-3-59           | Raingage             | I-31-R           |                                  |                 |                  |
|                                                                                                                                 |                      |                    | Total            | nr                   | 2.36             |                                  |                 |                  |
| Notes:                                                                                                                          |                      |                    |                  |                      |                  |                                  |                 |                  |
| Antecedent precipitation for event of July 3-4, 1959: 1.26 in. (6-20, 21) + 1.83 in. (6-27, 28) + .43 in. (6-29, 30) = 3.52 in. |                      |                    |                  |                      |                  |                                  |                 |                  |



HASTINGS, NEBRASKA WATERSHED W-8



| MONTHLY PRECIPITATION AND RUNOFF (Inches) |      |      |       |      |      |       |      | Hastings, Nebraska Watershed W-11<br>Area - 3490 acres (5.45 sq. mi.) |       |      |      |      |       |
|-------------------------------------------|------|------|-------|------|------|-------|------|-----------------------------------------------------------------------|-------|------|------|------|-------|
| Month<br>Year                             | Jan. | Feb. | Mar.  | Apr. | May  | June  | July | Aug.                                                                  | Sept. | Oct. | Nov. | Dec. | Year  |
| 1956 P                                    | 0.24 | 0.20 | 0.25  | 0.94 | 0.85 | 3.61  | 2.90 | 1.60                                                                  | 1.18  | 0.68 | 0.00 | 0.05 | 12.59 |
| Q                                         | 0    | T    | T     | 0    | 0    | .39   | .26  | .10                                                                   | .01   | 0    | 0    | 0    | .76   |
| 1957 P                                    | .16  | .06  | 1.92  | 3.03 | 6.38 | 11.77 | .28  | 5.45                                                                  | .46   | 1.25 | .59  | .22  | 31.58 |
| Q                                         | 0    | 0    | T     | .19  | 1.39 | 5.22  | 0    | 1.19                                                                  | 0     | 0    | 0    | 0    | 7.99  |
| 1958 P                                    | .12  | 1.30 | 2.59  | 1.82 | 1.46 | 3.37  | 4.80 | 3.74                                                                  | 1.80  | .13  | .50  | .05  | 21.68 |
| Q                                         | 0    | T    | e .25 | .09  | 0    | .26   | .33  | .38                                                                   | .07   | 0    | 0    | 0    | 1.38  |
| 1959 P                                    | .30  | .34  | 3.65  | .89  | 6.49 | 4.92  | 2.98 | 3.61                                                                  | 4.61  | 2.01 | 0    | .07  | 29.87 |
| Q                                         | 0    | .01  | .13   | .03  | .80  | .86   | 1.26 | .23                                                                   | .59   | .09  | 0    | 0    | 4.00  |

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

HASTINGS, NEBRASKA, WATERSHED W-11

| YEAR | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |          |      |       |      |        |           |
|------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|----------|------|-------|------|--------|-----------|
|      |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours |      | 1 day |      | 2 days |           |
|      | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date     | Vol. | Date  | Vol. | Date   | Vol.      |
| 1958 | 8-16              | 0.03 | 8-16                                      | .03  | 8-16    | .06  | 8-16    | .16  | 8-16     | .26  | 8-16  | .33  | 8-16   | .33       |
|      |                   |      |                                           |      |         |      |         |      |          |      |       |      | 3-26   | e .33 1/2 |
| 1959 | 7-3               | .24  | 7-3                                       | .22  | 7-3     | .40  | 7-3     | .84  | 7-3      | 1.19 | 7-3   | 1.25 | 7-3    | 1.25      |
|      |                   |      |                                           |      |         |      |         |      |          |      |       |      | 6-27   | 1.84      |

Notes: Quality of Records: Monthly P - excellent except Dec., Jan., Feb. and Mar. which were fair to good; monthly Q, annual maximum discharges and volumes, fair. Watershed conditions: Mixed cover watershed with about 66% in cultivation, 25% in native grasses, 5% in alfalfa, and 4% in roads and farmsteads. All crops were poor in 1956 and good to excellent in 1957, 1958 and 1959. A wheat, corn, sorghum and fallow rotation was followed. e - estimated or partially estimated. 1/ .33 also occurred beginning 8-16-58.

| SELECTED RUNOFF EVENTS                                                                                        |                      |                 |               |                   |               | HASTINGS, NEBRASKA WATERSHED W-11 |              |               |  |
|---------------------------------------------------------------------------------------------------------------|----------------------|-----------------|---------------|-------------------|---------------|-----------------------------------|--------------|---------------|--|
| Antecedent conditions                                                                                         |                      |                 | Rainfall      |                   |               | Runoff                            |              |               |  |
| Date                                                                                                          | Rainfall 2/ (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                     | Rate (in/hr) | Acc. (inches) |  |
| Event of June 15 and 16, 1957                                                                                 |                      |                 |               |                   |               |                                   |              |               |  |
| 5-16-57                                                                                                       | .06                  | T               | 6-15-57       | Rainage           | D-31-R        | 6-15-57                           |              |               |  |
| 5-29                                                                                                          | .77                  | .06             | 11:06a        | 0                 | 0             | 11:10a                            | .0002        | 0             |  |
| 5-31                                                                                                          | .21                  | .02             | :10           | 3.30              | .22           | 12:20p                            | .0009        | .0005         |  |
| 6-6                                                                                                           | .08                  | 0               | :25           | 1.60              | .62           | 1:30                              | .0128        | .0082         |  |
| 6-10                                                                                                          | .55                  | T               | :29           | .30               | .64           | 2:30                              | .0294        | .0311         |  |
| 6-13, 14                                                                                                      | .80                  | .03             | :33           | 1.80              | .76           | 3:30                              | .0394        | .0653         |  |
| 6-15                                                                                                          |                      | .01             | :51           | .37               | .97           | 4:30                              | .0588        | .1119         |  |
| Watershed conditions:                                                                                         |                      |                 | 12:00m        | 2.13              | 1.19          | 6:00                              | .107         | .2356         |  |
| Corn - 5" high, poor condition.                                                                               |                      |                 | :04p          | .60               | 1.23          | :30                               | .163         | .3031         |  |
| Wheat - 4' high, headed and in good condition.                                                                |                      |                 | 4:50          | 0                 | 1.23          | :50                               | .219         | .3668         |  |
| Sorghum - being replanted.                                                                                    |                      |                 | 5:36          | .43               | 1.56          | 7:00                              | .238         | .4049         |  |
| Oats - 20" high, good condition.                                                                              |                      |                 | :48           | 1.05              | 1.77          | :32                               | .240         | .5319         |  |
| Alfalfa - most of it cut, good condition.                                                                     |                      |                 | :57           | 3.27              | 2.26          | 8:02                              | .355         | .6808         |  |
| Meadow and pasture - excellent condition.                                                                     |                      |                 | 6:18          | .97               | 2.60          | :33                               | .375         | .8681         |  |
|                                                                                                               |                      |                 | :29           | 3.11              | 3.17          | :56                               | .406         | 1.0182        |  |
| The corn was all planted by June 1; the fallow ground was plowed and void of cover prior to the storm.        |                      |                 | :50           | 1.28              | 3.62          | 9:16                              | .415         | 1.1552        |  |
| Watershed predominantly straight-row farmed. The land use in percentage of the watershed area was as follows: |                      |                 | 7:50          | .54               | 4.16          | :30                               | .406         | 1.2510        |  |
| Corn . . . . . 5%                                                                                             |                      |                 | 8:30          | 1.56              | 5.20          | :56                               | .375         | 1.4198        |  |
| Wheat . . . . . 14%                                                                                           |                      |                 | :55           | .62               | 5.46          | 10:30                             | .313         | 1.6156        |  |
| Oats . . . . . 2%                                                                                             |                      |                 | 11:06         | .29               | 6.09          | 11:00                             | .274         | 1.7263        |  |
| Sorghum in rows . . . . . 27%                                                                                 |                      |                 | :48           | .04               | 6.12          | 6-16-57                           |              |               |  |
| Fallow . . . . . 17%                                                                                          |                      |                 | 6-16-57       |                   |               | 12:30a                            | .219         | 2.1243        |  |
| Clover . . . . . 1%                                                                                           |                      |                 | 12:10a        | .28               | 6.23          | 1:00                              | .213         | 2.2343        |  |
| Alfalfa . . . . . 6%                                                                                          |                      |                 | 6:10          | .03               | 6.40          | 2:00                              | .171         | 2.4261        |  |
| Pasture . . . . . 22%                                                                                         |                      |                 |               |                   |               | 3:30                              | .147         | 2.6654        |  |
| Meadow . . . . . 2%                                                                                           |                      |                 |               |                   |               | 5:30                              | .0984        | 2.9081        |  |
| Farmsteads . . . . . 2%                                                                                       |                      |                 |               |                   |               | 6:30                              | .0819        | 2.9982        |  |
| Roads . . . . . 2%                                                                                            |                      |                 |               |                   |               | 9:00                              | .0656        | 3.1821        |  |
|                                                                                                               |                      |                 |               |                   |               | 11:00                             | .0124        | 3.2444        |  |
|                                                                                                               |                      |                 |               |                   |               | 2:00p                             | .0027        | 3.2812        |  |
|                                                                                                               |                      |                 |               |                   |               | 9:10 3/                           | .0008        | 3.2920        |  |

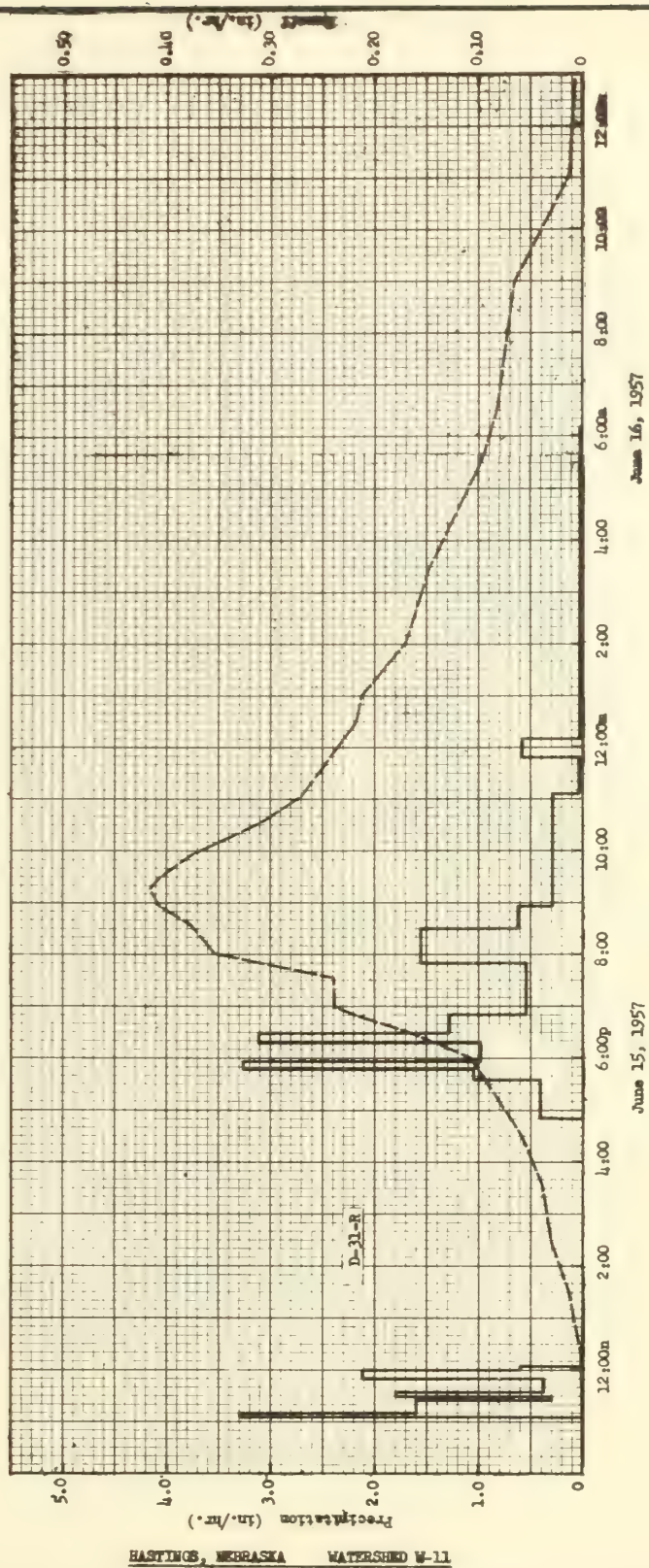
Notes: To convert runoff in in/hr to cfs, multiply by 3519. Weighted precipitation for event of 6-15 and 16-57 is 5.06 inches by the Thiessen method. 2/ All antecedent rainfall is weighted using the Thiessen method. 3/ Beginning of new storm.



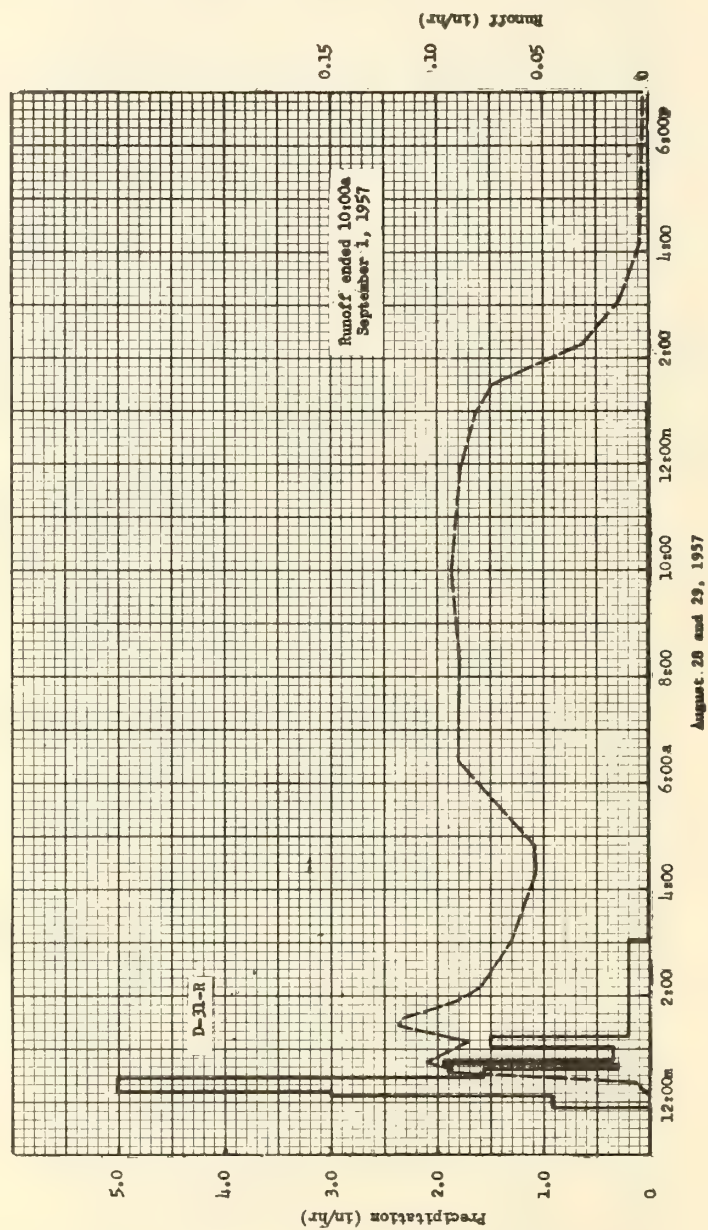
| SELECTED RUNOFF EVENTS                    |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed W-11 |                 |                  |
|-------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|-----------------------------------|-----------------|------------------|
| Antecedent conditions                     |                      |                    | Rainfall         |                      |                  | Runoff                            |                 |                  |
| Date                                      | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                  | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 15 and 16, 1957 - Continued |                      |                    |                  |                      |                  |                                   |                 |                  |
|                                           |                      |                    | 6-15-57          | Rain gauge           | A-31-R           |                                   |                 |                  |
|                                           |                      |                    | 10:58a           | 0                    | 0                |                                   |                 |                  |
|                                           |                      |                    | 11:10            | 1.50                 | .30              |                                   |                 |                  |
|                                           |                      |                    | :38              | 1.59                 | 1.04             |                                   |                 |                  |
|                                           |                      |                    | :50              | 3.30                 | 1.70             |                                   |                 |                  |
|                                           |                      |                    | 12:10p           | .48                  | 1.85             |                                   |                 |                  |
|                                           |                      |                    | 5:10             | T                    | 1.88             |                                   |                 |                  |
|                                           |                      |                    | :39              | .33                  | 2.04             |                                   |                 |                  |
|                                           |                      |                    | 6:35             | 1.21                 | 3.17             |                                   |                 |                  |
|                                           |                      |                    | 7:40             | .38                  | 3.58             |                                   |                 |                  |
|                                           |                      |                    | 8:34             | .86                  | 4.35             |                                   |                 |                  |
|                                           |                      |                    | 9:39             | .03                  | 4.38             |                                   |                 |                  |
|                                           |                      |                    | :58              | 1.04                 | 4.71             |                                   |                 |                  |
|                                           |                      |                    | 10:18            | .09                  | 4.74             |                                   |                 |                  |
|                                           |                      |                    | :51              | 1.02                 | 5.30             |                                   |                 |                  |
|                                           |                      |                    | 11:41            | 0                    | 5.30             |                                   |                 |                  |
|                                           |                      |                    | :52              | .98                  | 5.13             |                                   |                 |                  |
|                                           |                      |                    | 6-16-57          |                      |                  |                                   |                 |                  |
|                                           |                      |                    | 9:00a            | .02                  | 5.67             |                                   |                 |                  |
|                                           |                      |                    | 6-15-57          | Rain gauge           | B-32-R           |                                   |                 |                  |
|                                           |                      |                    | 10:51a           | 0                    | 0                |                                   |                 |                  |
|                                           |                      |                    | 11:50a           |                      | 5.51             |                                   |                 |                  |
|                                           |                      |                    | 6-16-57          |                      |                  |                                   |                 |                  |
|                                           |                      |                    | 12:50p           |                      | 5.05             |                                   |                 |                  |
|                                           |                      |                    | 6-15-57          | Rain gauge           | C-31-R           |                                   |                 |                  |
|                                           |                      |                    | 11:06a           | 0                    | 0                |                                   |                 |                  |
|                                           |                      |                    | :10              | .75                  | .05              |                                   |                 |                  |
|                                           |                      |                    | :30              | 2.46                 | .87              |                                   |                 |                  |
|                                           |                      |                    | :54              | .75                  | 1.17             |                                   |                 |                  |
|                                           |                      |                    | 12:04p           | 2.02                 | 1.44             |                                   |                 |                  |
|                                           |                      |                    | :10              | .50                  | 1.70             |                                   |                 |                  |
|                                           |                      |                    | 2:10             | .01                  | 1.72             |                                   |                 |                  |
|                                           |                      |                    | 5:00             | 0                    | 1.72             |                                   |                 |                  |
|                                           |                      |                    | :18              | .25                  | 1.92             |                                   |                 |                  |
|                                           |                      |                    | 6:02             | 2.19                 | 2.43             |                                   |                 |                  |
|                                           |                      |                    | :22              | .37                  | 2.72             |                                   |                 |                  |
|                                           |                      |                    | :54              | 1.41                 | 3.47             |                                   |                 |                  |
|                                           |                      |                    | 7:31             | .38                  | 3.72             |                                   |                 |                  |
|                                           |                      |                    | :58              | 1.15                 | 4.10             |                                   |                 |                  |
|                                           |                      |                    | 8:12             | .51                  | 4.30             |                                   |                 |                  |
|                                           |                      |                    | :34              | 1.91                 | 5.00             |                                   |                 |                  |
|                                           |                      |                    | 9:30             | .15                  | 5.14             |                                   |                 |                  |
|                                           |                      |                    | :58              | 0                    | 5.14             |                                   |                 |                  |
|                                           |                      |                    | 10:10            | 1.00                 | 5.34             |                                   |                 |                  |
|                                           |                      |                    | :36              | .16                  | 5.41             |                                   |                 |                  |
|                                           |                      |                    | 11:06            | .33                  | 5.34             |                                   |                 |                  |
|                                           |                      |                    | 6-16-57          |                      |                  |                                   |                 |                  |
|                                           |                      |                    | 3:00a            | .13                  | 5.12             |                                   |                 |                  |
|                                           |                      |                    | 6-15-57          | Rain gauge           | E-30-R           |                                   |                 |                  |
|                                           |                      |                    | 10:23a           | 0                    | 0                |                                   |                 |                  |
|                                           |                      |                    | 11:04a           |                      | 5.05             |                                   |                 |                  |
|                                           |                      |                    | 6-16-57          |                      |                  |                                   |                 |                  |
|                                           |                      |                    | 1:20a            |                      | 5.05             |                                   |                 |                  |
|                                           |                      |                    | 6-15-57          | Rain gauge           | G-12-R           |                                   |                 |                  |
|                                           |                      |                    | 11:06a           | 0                    | 0                |                                   |                 |                  |
|                                           |                      |                    | :18              | .30                  | .06              |                                   |                 |                  |
|                                           |                      |                    | :42              | .98                  | .45              |                                   |                 |                  |
|                                           |                      |                    | 12:32p           | .06                  | .50              |                                   |                 |                  |
|                                           |                      |                    | 2:32             | 0                    | .50              |                                   |                 |                  |
|                                           |                      |                    | 3:32             | .02                  | .52              |                                   |                 |                  |
|                                           |                      |                    | 5:00             | 0                    | .52              |                                   |                 |                  |
|                                           |                      |                    | :45              | .49                  | .99              |                                   |                 |                  |
|                                           |                      |                    | :58              | 2.17                 | 1.35             |                                   |                 |                  |
|                                           |                      |                    | 6:13             | .72                  | 1.53             |                                   |                 |                  |
|                                           |                      |                    | :43              | 2.74                 | 3.13             |                                   |                 |                  |
|                                           |                      |                    | 8:18             | .49                  | 3.86             |                                   |                 |                  |
|                                           |                      |                    | 9:11             | 1.54                 | 5.40             |                                   |                 |                  |
|                                           |                      |                    | 6-16-57          |                      |                  |                                   |                 |                  |
|                                           |                      |                    | 12:08a           | .12                  | 5.74             |                                   |                 |                  |
|                                           |                      |                    | 7:28             | .02                  | 5.89             |                                   |                 |                  |
| Notes:                                    |                      |                    |                  |                      |                  |                                   |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                              |                   |                 |               |                   | Hastings, Nebraska Watershed W-11 |               |              |               |
|---------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-------------------|-----------------------------------|---------------|--------------|---------------|
| Antecedent conditions                                                                                               |                   |                 | Rainfall      |                   |                                   | Runoff        |              |               |
| Date                                                                                                                | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches)                     | Date and time | Rate (in/hr) | Acc. (inches) |
| Event of August 28 - September 1, 1957                                                                              |                   |                 |               |                   |                                   |               |              |               |
| 8-23-57                                                                                                             | .76               | 0               | 8-28-57       | Raingage          | D-31-R                            | 8-29-57       |              |               |
| 8-15,16                                                                                                             | 1.92              | .0129           | 11:53p        | 0                 | 0                                 | 12:07a        | 0            | 0             |
| 8-23                                                                                                                | .09               | 0               | 8-28-57       |                   |                                   | :21           | .0068        | .0004         |
| 8-28                                                                                                                | .09               | 0               | 12:00a        | .92               | .23                               | :35           | .0059        | .0116         |
|                                                                                                                     |                   |                 | :11           | 3.00              | .38                               | :38           | .0934        | .0163         |
| Watershed Conditions:                                                                                               |                   |                 | :27           | 1.02              | 1.72                              | :40           | .105         | .0329         |
| Corn - in roasting-ear stage,                                                                                       |                   |                 | :37           | 1.58              | 1.98                              | 1:08          | .0854        | .0417         |
| damaged from grasshoppers.                                                                                          |                   |                 | :43           | .30               | 2.01                              | :28           | .118         | .0972         |
| Sorghum - 2' high and heading,                                                                                      |                   |                 | :47           | 1.95              | 2.11                              | :33           | .117         | .1070         |
| good condition.                                                                                                     |                   |                 | 1:03          | .34               | 2.23                              | :55           | .0915        | .1451         |
| Alfalfa - 3rd cutting about                                                                                         |                   |                 |               |                   |                                   |               |              |               |
| A. 2d. Good condition.                                                                                              |                   |                 | :13           | 1.50              | 2.48                              | 2:10          | .0796        | .1665         |
| Pasture - 6" high, fair condition.                                                                                  |                   |                 | 3:03          | .20               | 2.94                              | 3:00          | .0666        | .2282         |
| The fall plowing of the stubble                                                                                     |                   |                 | 1:03p         | .01               | 2.92                              | 4:20          | .0544        | .3088         |
| ground had started and the fallow                                                                                   |                   |                 |               |                   |                                   | :50           | .0549        | .3362         |
| ground was ready for planting of fall                                                                               |                   |                 | 8-28-57       | Raingage          | A-31-R                            | 4:25          | .0903        | .4525         |
| wheat. The watershed is predominant-                                                                                |                   |                 | 11:58p        | 0                 | 0                                 |               |              |               |
| ly straight-row farmed. The land use                                                                                |                   |                 | 8-29-57       |                   |                                   | 8:20          | .0897        | .6254         |
| in percentage of the watershed area                                                                                 |                   |                 | 12:10a        | .35               | .07                               | 10:00         | .0927        | .7764         |
| was as follows:                                                                                                     |                   |                 | :20           | 1.20              | .27                               | 12:00p        | .0173        | .9587         |
| Corn . . . . . 5%                                                                                                   |                   |                 | :29           | 2.93              | .71                               | 1:00p         | .0819        | 1.0436        |
| Wheat . . . . . 11%                                                                                                 |                   |                 | :44           | .80               | .91                               | :30           | .0744        | 1.0826        |
| Sorghum . . . . . 2%                                                                                                |                   |                 | :50           | 2.10              | 1.12                              | 2:15          | .0379        | 1.1259        |
| Sorghum in rows . . . . . 27%                                                                                       |                   |                 | 1:06          | .68               | 1.30                              | 3:05          | .0147        | 1.1466        |
| Fallow . . . . . 17%                                                                                                |                   |                 | :20           | 2.74              | 1.94                              | 4:10          | .0048        | 1.1564        |
| Clover . . . . . 1%                                                                                                 |                   |                 |               |                   |                                   | 9:00          | .0009        | 1.1656        |
| Alfalfa . . . . . 2%                                                                                                |                   |                 | 3:00          | .11               | 2.12                              | 9-1-57        |              |               |
| Pasture . . . . . 28%                                                                                               |                   |                 | 7:30          | 0                 | 2.12                              |               |              |               |
| Farmsteads . . . . . 2%                                                                                             |                   |                 | 1:00          | .01               | 2.15                              | 10:00a        | 0            | 1.1718        |
| Roads . . . . . 2%                                                                                                  |                   |                 |               |                   |                                   |               |              |               |
|                                                                                                                     |                   |                 | 8-29-57       | Raingage          | B-32-R                            |               |              |               |
|                                                                                                                     |                   |                 | 11:50p        | 0                 | 0                                 |               |              |               |
|                                                                                                                     |                   |                 | 8-29-57       |                   |                                   |               |              |               |
|                                                                                                                     |                   |                 | 12:14a        | .55               | .22                               |               |              |               |
|                                                                                                                     |                   |                 | :28           | 2.57              | .82                               |               |              |               |
|                                                                                                                     |                   |                 | :43           | .76               | 1.01                              |               |              |               |
|                                                                                                                     |                   |                 | :50           | 1.71              | 1.21                              |               |              |               |
|                                                                                                                     |                   |                 | 1:06          | .49               | 1.34                              |               |              |               |
|                                                                                                                     |                   |                 | 1:17          | 2.73              | 1.74                              |               |              |               |
|                                                                                                                     |                   |                 | 3:02          | .11               | 2.04                              |               |              |               |
|                                                                                                                     |                   |                 | 9:00          | 0                 | 2.04                              |               |              |               |
|                                                                                                                     |                   |                 | 11:30         | .01               | 2.07                              |               |              |               |
|                                                                                                                     |                   |                 | 8-29-57       | Raingage          | C-31-R                            |               |              |               |
|                                                                                                                     |                   |                 | Note:         | Clock Stopped     | 2.50                              |               |              |               |
|                                                                                                                     |                   |                 | Total         |                   |                                   |               |              |               |
|                                                                                                                     |                   |                 | 8-28-57       | Raingage          | E-30-R                            |               |              |               |
|                                                                                                                     |                   |                 | 11:50p        | 0                 | 0                                 |               |              |               |
|                                                                                                                     |                   |                 | :56           | .20               | .02                               |               |              |               |
|                                                                                                                     |                   |                 | 8-29-57       |                   |                                   |               |              |               |
|                                                                                                                     |                   |                 | 12:12a        | 1.42              | .40                               |               |              |               |
|                                                                                                                     |                   |                 | :18           | 1.50              | .95                               |               |              |               |
|                                                                                                                     |                   |                 | :30           | 3.40              | 1.53                              |               |              |               |
|                                                                                                                     |                   |                 | :50           | .81               | 1.30                              |               |              |               |
|                                                                                                                     |                   |                 | 1:04          | .13               | 1.83                              |               |              |               |
|                                                                                                                     |                   |                 | :08           | 1.45              | 1.94                              |               |              |               |
|                                                                                                                     |                   |                 | :11           | 1.70              | 2.41                              |               |              |               |
|                                                                                                                     |                   |                 | :17           | 4.07              | 2.55                              |               |              |               |
|                                                                                                                     |                   |                 | 2:02          | .21               | 2.71                              |               |              |               |
|                                                                                                                     |                   |                 | 5:02          | .05               | 2.85                              |               |              |               |
|                                                                                                                     |                   |                 | 8-28-57       | Raingage          | G-42-R                            |               |              |               |
|                                                                                                                     |                   |                 | 11:46p        | 0                 | 0                                 |               |              |               |
|                                                                                                                     |                   |                 | :51           | .36               | .03                               |               |              |               |
|                                                                                                                     |                   |                 | 8-29-57       |                   |                                   |               |              |               |
|                                                                                                                     |                   |                 | 12:06a        | 1.88              | .50                               |               |              |               |
|                                                                                                                     |                   |                 | :25           | 4.36              | 1.88                              |               |              |               |
|                                                                                                                     |                   |                 | 1:06          | .72               | 2.37                              |               |              |               |
|                                                                                                                     |                   |                 | 1:14          | 3.75              | 2.87                              |               |              |               |
|                                                                                                                     |                   |                 | 5:34          | .05               | 3.10                              |               |              |               |
| Notes: Weighted precipitation for the event of August 28 - September 1, 1957 is 2.60 inches by the Thiessen method. |                   |                 |               |                   |                                   |               |              |               |

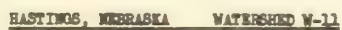
| SELECTED RUNOFF EVENTS                                                                                                                                                                          |                   |                 |               |                   |               | HASTINGS, NEBRASKA WATERSHED W-11 |              |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-------------------|---------------|-----------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                           |                   |                 | Rainfall      |                   |               | Runoff                            |              |               |
| Date                                                                                                                                                                                            | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                     | Rate (in/hr) | Acc. (inches) |
| Event of July 3 to 6, 1959                                                                                                                                                                      |                   |                 |               |                   |               |                                   |              |               |
| 6-19-59                                                                                                                                                                                         | .67               | .01             | 7-3-59        | Raingage          | E-30-R        | 7-3-59                            |              |               |
| 6-20                                                                                                                                                                                            | 1.23              | .19             | 8:20p         | 0                 | 0             | 8:41p                             | 0            | 0             |
| 6-21,22                                                                                                                                                                                         | .26               | .07             | :34           | .13               | .03           | :49                               | .0014        | .0001         |
| 6-27,28                                                                                                                                                                                         | 1.87              | .54             | :40           | 3.50              | .38           | 9:01                              | .0258        | .0031         |
| 6-29,30                                                                                                                                                                                         | .35               | .05             | :48           | 4.80              | 1.02          | :29                               | .145         | .0432         |
| Watershed Conditions:                                                                                                                                                                           |                   |                 | :52           | 3.15              | 1.23          | :33                               | .145         | .0529         |
| Corn - 1' high, thin stand, poor condition.                                                                                                                                                     |                   |                 | 9:00          | 2.02              | 1.50          | 10:01                             | .115         | .1134         |
| Wheat - 3-4' high, ripe, good condition.                                                                                                                                                        |                   |                 | :04           | 2.70              | 1.68          | :21                               | .0970        | .1486         |
| Sorghum - 6" high, good stand.                                                                                                                                                                  |                   |                 | :08           | 6.00              | 2.08          | :45                               | .0910        | .1861         |
| Oats - 2' high, thin stand.                                                                                                                                                                     |                   |                 | :12           | 4.20              | 2.36          | :57                               | .0925        | .2044         |
| Alfalfa - 1st cutting picked up;                                                                                                                                                                |                   |                 | :16           | 2.40              | 2.52          | 11:01                             | .103         | .2109         |
| 2nd growth about 4" high.                                                                                                                                                                       |                   |                 | :20           | 1.65              | 2.63          | :09                               | .152         | .2277         |
| Fallow - ground bare, loose and rough.                                                                                                                                                          |                   |                 | :30           | .12               | 2.65          | :25                               | .221         | .2781         |
| Meadow - 8" high, good condition                                                                                                                                                                |                   |                 | 7-4-59        |                   |               | :41                               | .237         | .3401         |
| Pasture - good cover, good condition.                                                                                                                                                           |                   |                 | 10:00a        | 0                 | 2.65          | 7-4-59                            |              |               |
| Most of fallow ground had been plowed before the storm. The watershed is predominantly straight row farmed. The land use (partly estimated) in percentage of the watershed area was as follows: |                   |                 | 3:30          | T                 | 2.68          | 12:01a                            | .223         | .4174         |
| Corn . . . . . 9%                                                                                                                                                                               |                   |                 | 7-3-59        | Raingage          | A-31-R        | 2:01                              | .109         | .7401         |
| Wheat . . . . . 21%                                                                                                                                                                             |                   |                 | 8:31p         | 0                 | 0             | 3:01                              | .0853        | .8360         |
| Oats . . . . . 1%                                                                                                                                                                               |                   |                 | :40           | 6.47              | .97           | 5:01                              | .0635        | .9826         |
| Sorghum in rows . . . . . 19%                                                                                                                                                                   |                   |                 | :44           | 4.20              | 1.25          | 7:01                              | .0530        | 1.0986        |
| Fallow . . . . . 15%                                                                                                                                                                            |                   |                 | :49           | 2.64              | 1.47          | 9:21                              | .0369        | 1.2054        |
| Sudan . . . . . 1%                                                                                                                                                                              |                   |                 | :52           | 1.40              | 1.47          | 10:33                             | .0119        | 1.2347        |
| Alfalfa . . . . . 5%                                                                                                                                                                            |                   |                 | 9:02          | 2.34              | 1.93          | 12:01p                            | .0028        | 1.2460        |
| Pasture . . . . . 22%                                                                                                                                                                           |                   |                 | :13           | 1.00              | 2.26          | 7-5-59                            |              |               |
| Meadow . . . . . 3%                                                                                                                                                                             |                   |                 | :17           | .75               | 2.31          | 12:01a                            | .0001        | 1.2525        |
| Farmsteads . . . . . 2%                                                                                                                                                                         |                   |                 | :37           | .06               | 2.33          | 7-6-59                            |              |               |
| Roads . . . . . 2%                                                                                                                                                                              |                   |                 | 7-3-59        | Raingage          | B-32-R        | 11:30p 1/                         | T            | 1.2526        |
|                                                                                                                                                                                                 |                   |                 | 8:32p         | 0                 | 0             |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :44           | 5.75              | 1.15          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 9:02          | 1.89              | 1.79          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :06           | 2.70              | 1.97          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :10           | 3.75              | 2.22          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :14           | 2.70              | 2.40          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :17           | .80               | 2.44          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :25           | .15               | 2.46          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 7-4-59        |                   |               |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 10:00a        | 0                 | 2.46          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 3:30p         | T                 | 2.48          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 7-3-59        | Raingage          | C-31-R        |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 8:32p         | 0                 | 0             |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :36           | 2.55              | .17           |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :41           | 6.12              | .68           |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :46           | 3.96              | 1.01          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :50           | 1.65              | 1.12          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :54           | 3.60              | 1.36          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 9:06          | 1.95              | 1.75          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :14           | 5.02              | 2.42          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :18           | 1.20              | 2.50          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :22           | .45               | 2.53          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 7-4-59        |                   |               |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 12:00n        | T                 | 2.57          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 7-3-59        | Raingage          | D-31-R        |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | Total         | nr                | 2.36          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 7-3-59        | Raingage          | G-42-R        |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 8:40p         | 0                 | 0             |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :42           | 2.40              | .08           |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :48           | 4.00              | .48           |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :55           | 2.49              | .77           |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 9:00          | .84               | .84           |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :07           | 2.66              | 1.15          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :25           | 4.40              | 2.47          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | :30           | .36               | 2.49          |                                   |              |               |
|                                                                                                                                                                                                 |                   |                 | 10:00         | .02               | 2.51          |                                   |              |               |
| Notes: Weighted precipitation for the event of July 3-6, 1959 is 2.49 inches by the Thiessen method.                                                                                            |                   |                 |               |                   |               |                                   |              |               |
| 1/ Beginning of new rainfall event.                                                                                                                                                             |                   |                 |               |                   |               |                                   |              |               |

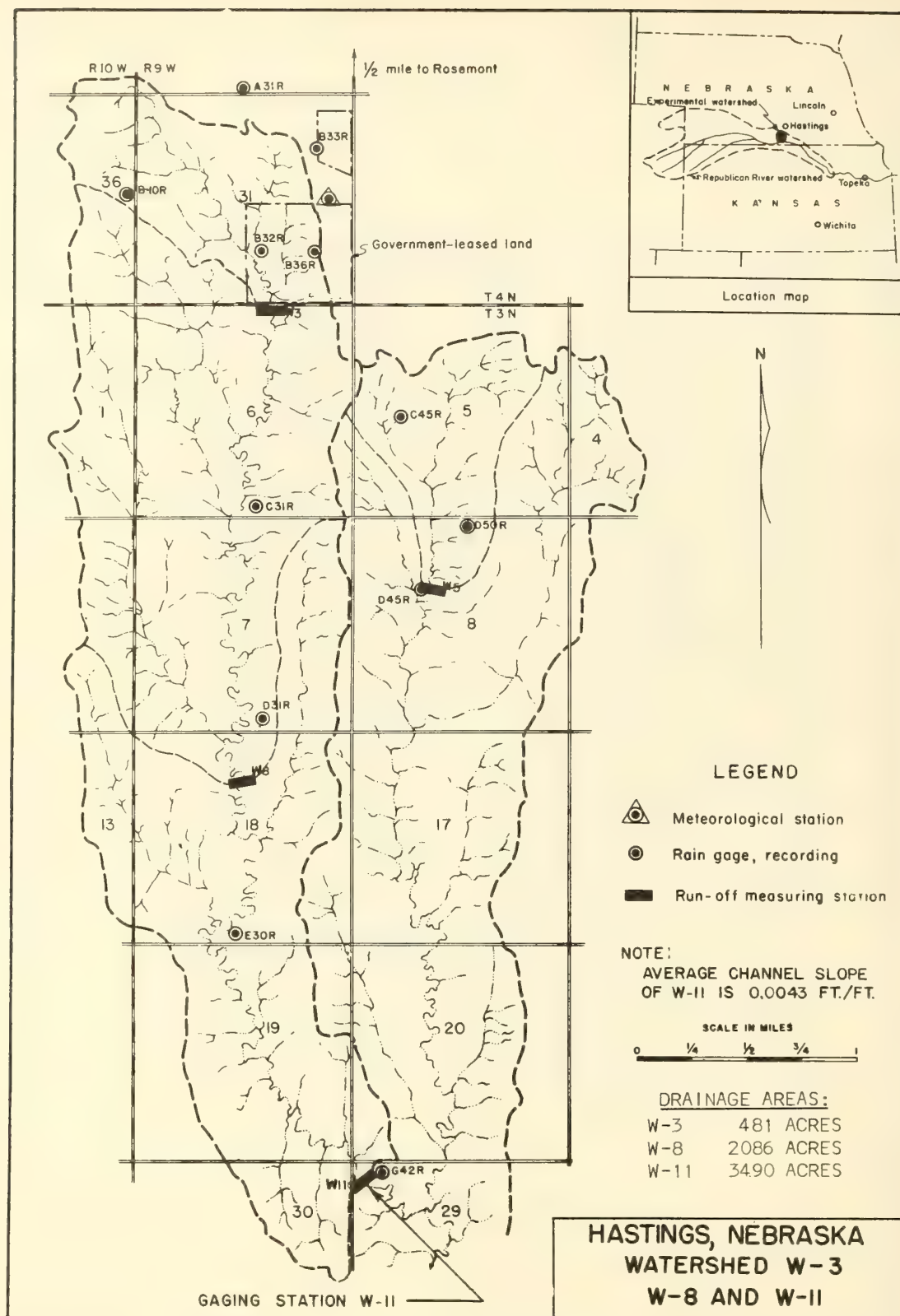






HASTINGS, NEBRASKA WATERSHED W-11



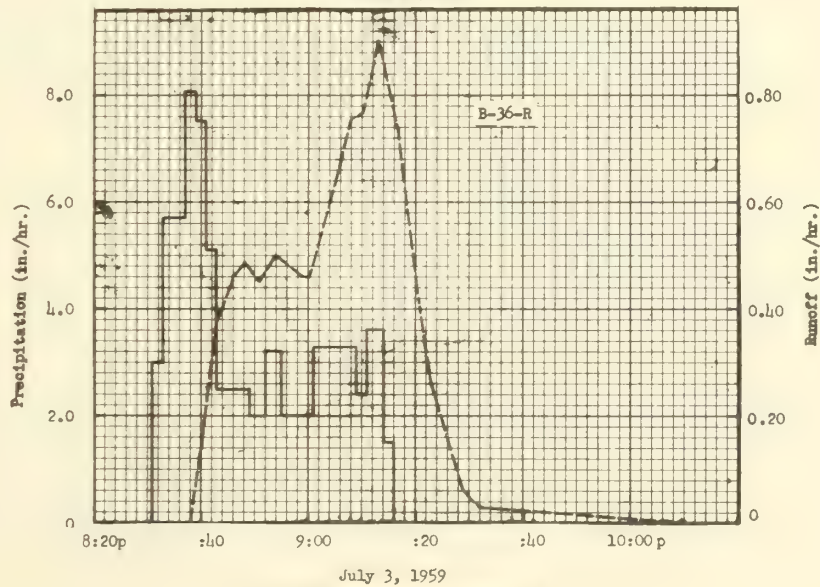
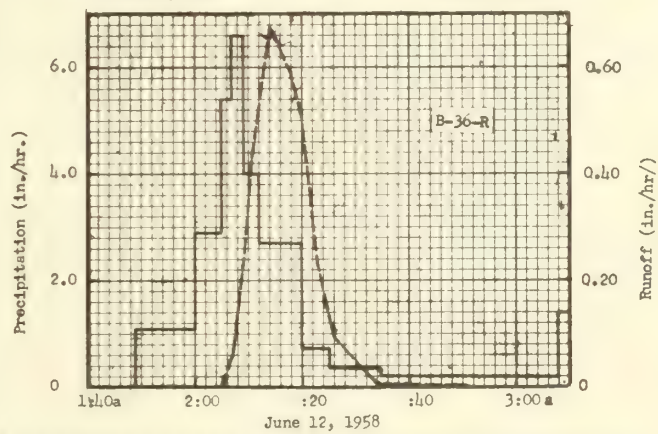
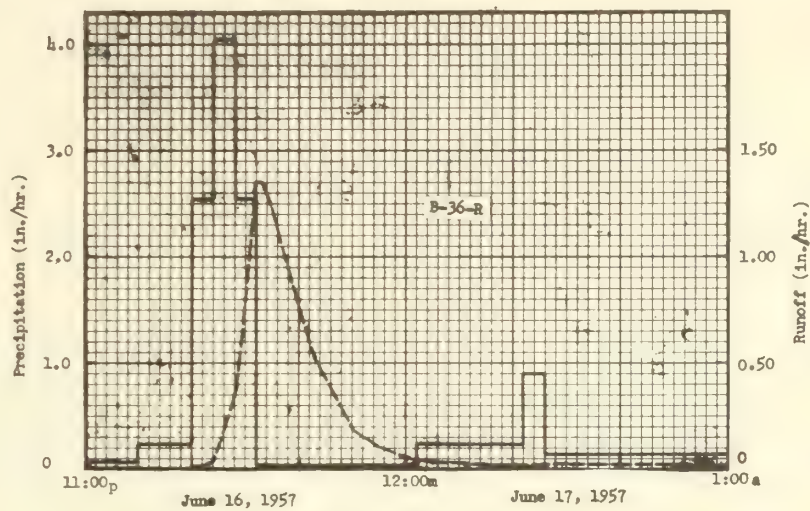




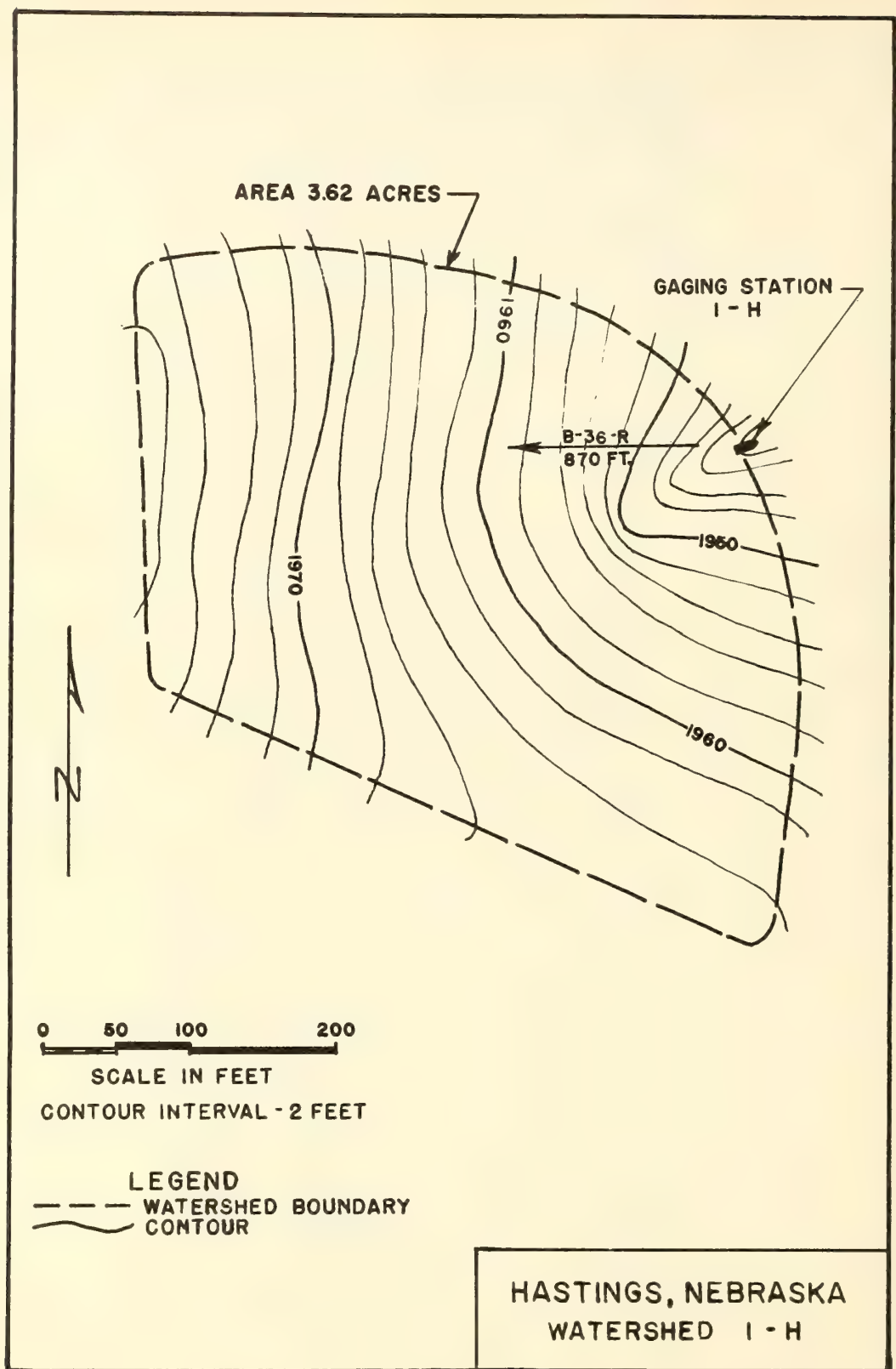
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                        |                   |                 |                                           |                   |               |               |               | Hastings, Nebraska Watershed 1-H<br>(Area - 3.62 acres) |             |           |           |           |           |               |        |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|---------------|---------------------------------------------------------|-------------|-----------|-----------|-----------|-----------|---------------|--------|------|
| Year                                                                                                                                                                                                                             | Month             | Jan.            | Feb.                                      | Mar.              | Apr.          | May           | June          | July                                                    | Aug.        | Sept.     | Oct.      | Nov.      | Dec.      | Year          |        |      |
| 1956                                                                                                                                                                                                                             | P<br>Q            | 0.18<br>0       | 0.03<br>0                                 | 0.30<br>0         | 1.10<br>0     | 1.56<br>0     | 1.22<br>0     | 2.48<br>0                                               | 1.59<br>0   | 1.21<br>0 | 0.81<br>0 | 0.10<br>0 | 0.05<br>0 | 12.91<br>T    |        |      |
| 1957                                                                                                                                                                                                                             | P<br>Q            | .13<br>0        | .08<br>0                                  | 1.85<br>0         | 3.01<br>0     | 6.93<br>T     | 11.33<br>1.13 | .19<br>0                                                | 5.46<br>.04 | .44<br>0  | 1.31<br>0 | .58<br>0  | .12<br>0  | 31.43<br>1.17 |        |      |
| 1958                                                                                                                                                                                                                             | P<br>Q            | .07<br>0        | 1.21<br>0                                 | 1.97<br>0         | 1.73<br>0     | 1.50<br>0     | 2.88<br>.11   | 4.74<br>0                                               | 3.51<br>0   | 1.49<br>0 | .08<br>0  | .45<br>0  | .03<br>0  | 19.69<br>.11  |        |      |
| 1959                                                                                                                                                                                                                             | P<br>Q            | .21<br>0        | .25<br>0                                  | 3.29<br>.02       | .38<br>0      | 6.26<br>T     | 4.49<br>0     | 3.12<br>.42                                             | 3.32<br>.01 | 4.20<br>T | 1.87<br>0 | T<br>0    | .06<br>0  | 28.95<br>.45  |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                          |                   |                 |                                           |                   |               |               |               | Hastings, Nebraska Watershed 1-H                        |             |           |           |           |           |               |        |      |
| YEAR                                                                                                                                                                                                                             | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |               |                                                         |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours       |                                                         | 12 hours    |           | 1 day     |           | 2 days    |               | 8 days |      |
|                                                                                                                                                                                                                                  | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date          | Vol.                                                    | Date        | Vol.      | Date      | Vol.      | Date      | Vol.          | Date   | Vol. |
| 1957                                                                                                                                                                                                                             | 6-16              | 1.35            | 6-16                                      | 0.32              | 6-15          | 0.47          | 6-15          | 0.60                                                    | 6-15        | 0.60      | 6-15      | 0.60      | 6-15      | 0.96          | 6-10   | 1.13 |
| 1958                                                                                                                                                                                                                             | 6-12              | .68             | 6-12                                      | .11               | 6-12          | .11           | 6-12          | .11                                                     | 6-12        | .11       | 6-12      | .11       | 6-12      | .11           | 6-12   | .11  |
| 1959                                                                                                                                                                                                                             | 7-3               | .90             | 7-3                                       | .2                | 7-3           | .42           | 7-3           | .42                                                     | 7-3         | .42       | 7-3       | .42       | 7-3       | .42           | 7-3    | .42  |
| Notes: Quality of Records: Monthly P and Q values, annual maximum discharges and volumes - good to excellent.<br>Watershed Conditions: Native grass meadow - 1956, grass was four; 1957, 1958, and 1959, very good to excellent. |                   |                 |                                           |                   |               |               |               |                                                         |             |           |           |           |           |               |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                           |                   |                 |                                           |                   |               |               |               | Hastings, Nebraska Watershed 1-H                        |             |           |           |           |           |               |        |      |
| Antecedent conditions                                                                                                                                                                                                            |                   |                 |                                           | Rainfall          |               |               |               | Runoff                                                  |             |           |           |           |           |               |        |      |
| Date                                                                                                                                                                                                                             | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr)  | Acc. (inches)                                           |             |           |           |           |           |               |        |      |
| Event of June 16 and 17, 1957                                                                                                                                                                                                    |                   |                 |                                           |                   |               |               |               |                                                         |             |           |           |           |           |               |        |      |
| 5-29-57                                                                                                                                                                                                                          | .1                | 0               | 6-16-57                                   | Rain none         | B-36-R        | 6-16-57       |               |                                                         |             |           |           |           |           |               |        |      |
| 5-31                                                                                                                                                                                                                             | .32               |                 | 11:10p                                    | .06               | C             | 11:20p        | .0012         | 0                                                       |             |           |           |           |           |               |        |      |
| 6-5                                                                                                                                                                                                                              | .1                |                 | :20                                       | .24               |               | :24           | .0367         | T                                                       |             |           |           |           |           |               |        |      |
| 6-10                                                                                                                                                                                                                             | .05               | .05             | :24                                       | 2.55              | .21           | :28           | .353          | .01                                                     |             |           |           |           |           |               |        |      |
| 6-15                                                                                                                                                                                                                             | .13               | .13             | :28                                       | 1.1               | .43           | :30           | .800          | .03                                                     |             |           |           |           |           |               |        |      |
| 6-15                                                                                                                                                                                                                             | 5.82              | .60             | :32                                       | 2.55              | .5            | :32           | 1.35          | .07                                                     |             |           |           |           |           |               |        |      |
| 6-16 1/2                                                                                                                                                                                                                         | .83               | .01             | 6-17-60                                   |                   |               | :33           | 1.35          | .09                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 | 12:02a                                    | .04               | .67           | :35           | 1.25          | .13                                                     |             |           |           |           |           |               |        |      |
| Watershed Conditions: Native grass meadow - 11" high and heading; in excellent condition.                                                                                                                                        |                   |                 |                                           | :22               | .24           | .75           | :40           | .784                                                    | .22         |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 | :24                                       | .30               | .81           | :43           | .537          | .25                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 | 2:4                                       | .13               | 1.01          | :50           | .198          | .30                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               | :55           | .105          | .31                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               | 12:00m        | .0567         | .31                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               | 6-17-57       |               |                                                         |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               | 12:05a        | .0310         | .32                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               | :20           | .0167         | .32                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               | :30           | .0283         | .33                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               | 3:00          | 0             | .34                                                     |             |           |           |           |           |               |        |      |
| Event of June 12, 1958                                                                                                                                                                                                           |                   |                 |                                           |                   |               |               |               |                                                         |             |           |           |           |           |               |        |      |
| 5-11                                                                                                                                                                                                                             | .52               | 0               | 6-12-58                                   | Rain none         | B-36-R        | 6-12-58       |               |                                                         |             |           |           |           |           |               |        |      |
| 5-15                                                                                                                                                                                                                             | .22               | 0               | 1:49a                                     | 0                 | 0             | 2:05a         | 0             | 0                                                       |             |           |           |           |           |               |        |      |
| 5-16                                                                                                                                                                                                                             | .25               | 0               | 2:00                                      | 1.09              | .20           | :07           | .0403         | T                                                       |             |           |           |           |           |               |        |      |
| 5-26                                                                                                                                                                                                                             | .30               | 0               | :05                                       | 2.83              | .44           | :09           | .228          | .01                                                     |             |           |           |           |           |               |        |      |
| 5-27                                                                                                                                                                                                                             | .15               | 0               | :07                                       | 5.40              | .62           | :11           | .441          | .02                                                     |             |           |           |           |           |               |        |      |
| 6-6                                                                                                                                                                                                                              | .12               | 0               | :09                                       | 6.60              | .64           | :14           | .677          | .05                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 | :12                                       | 4.90              | 1.04          | :18           | .592          | .09                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 | :20                                       | 2.70              | 1.10          | :20           | .512          | .11                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 | :25                                       | .72               | 1.46          | :23           | .228          | .13                                                     |             |           |           |           |           |               |        |      |
| Watershed conditions: Native grass meadow - 10" high and in good condition.                                                                                                                                                      |                   |                 |                                           | :35               | .36           | 1.52          | :26           | .0951                                                   | .13         |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 | 3:08                                      | .20               | 1.43          | :29           | .0337         | .14                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 | :11                                       | 1.40              | 1.70          | :34           | .0095         | .14                                                     |             |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                  |                   |                 |                                           |                   |               | :51           | 0             | .14                                                     |             |           |           |           |           |               |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 3.650. 1/ Rainfall and runoff prior to event beginning 11:10p on 6-16-57.                                                                                                  |                   |                 |                                           |                   |               |               |               |                                                         |             |           |           |           |           |               |        |      |



| SELECTED RUNOFF EVENTS                                                                                |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed 1-H |                 |                  |
|-------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                 |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                  | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 3, 1959                                                                                 |                      |                    |                  |                      |                  |                                  |                 |                  |
| 6-18-59                                                                                               | .05                  | 0                  | 7-3-59           | Rainage              | B-36-R           | 7-3-59                           |                 |                  |
| 6-19                                                                                                  | .37                  | 0                  | 8:31p            | 0                    | 0                | 8:38p                            | 0               | 0                |
| 6-20                                                                                                  | 1.31                 | T                  | :33              | 3.00                 | .10              | :40                              | .138            | T                |
| 6-21                                                                                                  | .03                  | 0                  | :37              | 5.70                 | .48              | :43                              | .375            | .01              |
| 6-27,28                                                                                               | 1.93                 | 0                  | :39              | 3.10                 | .75              | :46                              | .463            | .03              |
| 6-29                                                                                                  | .19                  | 0                  | :41              | 7.50                 | 1.00             | :48                              | .488            | .05              |
| 6-30                                                                                                  | .22                  | 0                  | :43              | 5.10                 | 1.17             | :51                              | .452            | .07              |
|                                                                                                       |                      |                    | :49              | 2.50                 | 1.42             | :54                              | .501            | .10              |
|                                                                                                       |                      |                    | :52              | 2.00                 | 1.52             | :59                              | .463            | .11              |
|                                                                                                       |                      |                    | :55              | 3.20                 | 1.68             | 9:00                             | .463            | .15              |
| Watershed Conditions: Native grass<br>meadow - 18" high, early grass ripe,<br>in excellent condition. |                      |                    | 9:01             | 2.00                 | 1.88             | :06                              | .677            | .20              |
|                                                                                                       |                      |                    | :09              | 3.30                 | 2.32             | :08                              | .751            | .23              |
|                                                                                                       |                      |                    | :11              | 2.40                 | 2.40             | :10                              | .767            | .25              |
|                                                                                                       |                      |                    | :14              | 3.60                 | 2.58             | :13                              | .901            | .30              |
|                                                                                                       |                      |                    | :16              | 1.50                 | 2.63             | :17                              | .737            | .35              |
|                                                                                                       |                      |                    |                  |                      |                  | :21                              | .397            | .39              |
|                                                                                                       |                      |                    |                  |                      |                  | :23                              | .261            | .40              |
|                                                                                                       |                      |                    |                  |                      |                  | :29                              | .0603           | .41              |
|                                                                                                       |                      |                    |                  |                      |                  | :32                              | .0310           | .42              |
|                                                                                                       |                      |                    |                  |                      |                  | 10:10                            | 0               | .42              |
| Notes:                                                                                                |                      |                    |                  |                      |                  |                                  |                 |                  |

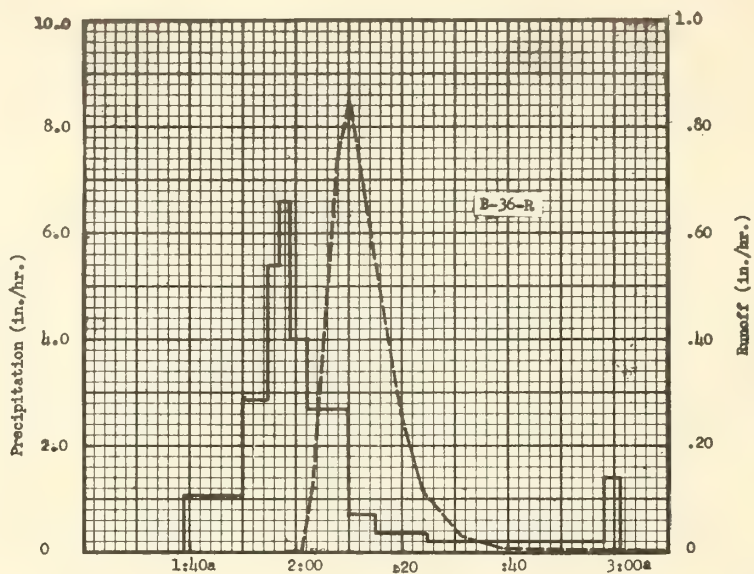


HASTINGS, NEBRASKA WATERSHED 1-H

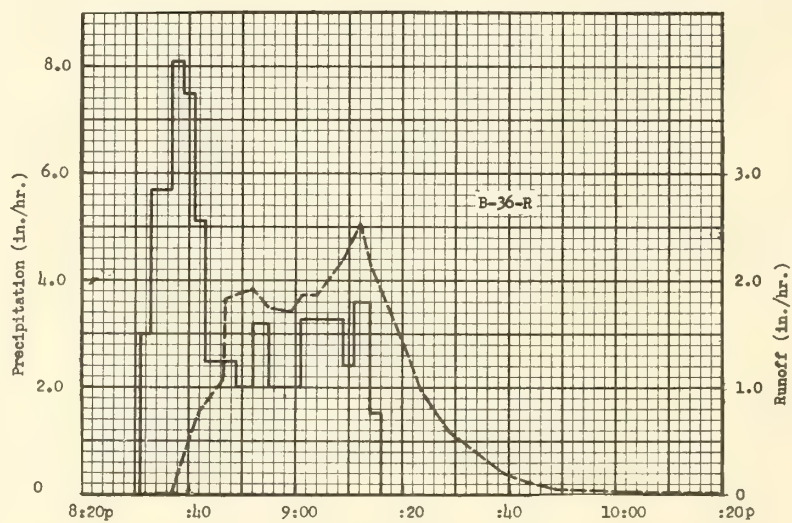


| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                 |                   |                 |                                           |                   |               |               |              | Hastings, Nebraska Watershed 2-H<br>(Area - 3.40 acres) |             |             |           |           |              |               |        |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|--------------|---------------------------------------------------------|-------------|-------------|-----------|-----------|--------------|---------------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                             | Jan.              | Feb.            | Mar.                                      | Apr.              | May           | June          | July         | Aug.                                                    | Sept.       | Oct.        | Nov.      | Dec.      | Year         |               |        |      |
| 1958 1/                                                                                                                                                                                                                                                   | P 0.07            | 1.24<br>0       | 1.97<br>0                                 | 1.73<br>0         | 1.50<br>0     | 2.88<br>.18   | 4.74<br>0    | 3.51<br>0                                               | 1.47<br>0   | 0.03<br>0   | 0.45<br>0 | 0.03<br>0 | 19.69<br>.18 |               |        |      |
| 1959                                                                                                                                                                                                                                                      | P<br>0            | .21<br>0        | .28<br>T                                  | 3.29<br>0         | .83<br>T      | 6.26<br>.09   | 4.89<br>.08  | 3.12<br>1.41                                            | 3.32<br>.03 | 4.80<br>.06 | 1.87<br>0 | T<br>0    | .06<br>0     | 24.95<br>1.68 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                   |                   |                 |                                           |                   |               |               |              | Hastings, Nebraska Watershed 2-H                        |             |             |           |           |              |               |        |      |
| YEAR                                                                                                                                                                                                                                                      | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |              |                                                         |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours      |                                                         | 12 hours    |             | 1 day     |           | 2 days       |               | 8 days |      |
|                                                                                                                                                                                                                                                           | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date         | Vol.                                                    | Date        | Vol.        | Date      | Vol.      | Date         | Vol.          | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                      | 6-12              | 0.45            | 6-12                                      | 0.18              | 6-12          | 0.18          | 6-12         | 0.18                                                    | 6-12        | 0.18        | 6-12      | 0.18      | 6-12         | 0.18          | 6-12   | 0.18 |
| 1959                                                                                                                                                                                                                                                      | 7-3               | 2.52            | 7-3                                       | 1.38              | 7-3           | 1.41          | 7-3          | 1.41                                                    | 7-3         | 1.41        | 7-3       | 1.41      | 7-3          | 1.41          | 6-27   | 1.49 |
| Notes: 1/ Runoff records discontinued 1-4-58; re-established 1-8-58. Quality of Records: Monthly P and Q values, annual maximum discharges and volumes - good to excellent. Watershed Conditions: Native grass meadow - good to excellent, 1958 and 1959. |                   |                 |                                           |                   |               |               |              |                                                         |             |             |           |           |              |               |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                    |                   |                 |                                           |                   |               |               |              | Hastings, Nebraska Watershed 2-H                        |             |             |           |           |              |               |        |      |
| Antecedent conditions                                                                                                                                                                                                                                     |                   |                 | Rainfall                                  |                   |               |               |              | Runoff                                                  |             |             |           |           |              |               |        |      |
| Date                                                                                                                                                                                                                                                      | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches)                                           |             |             |           |           |              |               |        |      |
| Event of June 12, 1958                                                                                                                                                                                                                                    |                   |                 |                                           |                   |               |               |              |                                                         |             |             |           |           |              |               |        |      |
| 5-14-58                                                                                                                                                                                                                                                   | .52               | 0               | 6-12-58                                   | Rain gauge        | B-36-R        | 6-12-58       |              |                                                         |             |             |           |           |              |               |        |      |
| 5-15                                                                                                                                                                                                                                                      | .22               | 0               | 1:48a                                     | 0                 | 0             | 2:00a         | 0            | 0                                                       |             |             |           |           |              |               |        |      |
| 5-16                                                                                                                                                                                                                                                      | .25               | 0               | 2:00                                      | 1.09              | .20           | :11           | .0006        | T                                                       |             |             |           |           |              |               |        |      |
| 5-24                                                                                                                                                                                                                                                      | .30               | 0               | :05                                       | 2.44              | .44           | :13           | .117         | T                                                       |             |             |           |           |              |               |        |      |
| 5-27                                                                                                                                                                                                                                                      | .15               | 0               | :08                                       | 5.40              | .72           | :18           | .750         | .04                                                     |             |             |           |           |              |               |        |      |
| 6-6                                                                                                                                                                                                                                                       | .12               | 0               | :09                                       | 4.80              | .84           | :20           | .849         | .06                                                     |             |             |           |           |              |               |        |      |
| Watershed conditions: Native grass meadow - 10" high and in good condition.                                                                                                                                                                               |                   |                 | :12                                       | 4.80              | 1.04          | :24           | .613         | .11                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :20                                       | 2.70              | 1.45          | :30           | .260         | .16                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :25                                       | .72               | 1.46          | :34           | .117         | .17                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :35                                       | .36               | 1.52          | :41           | .0330        | .18                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | 3:08                                      | .20               | 1.63          | :49           | .0068        | .18                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :11                                       | 1.40              | 1.70          | 3:43          | 0            | .18                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | Event of July 3, 1959                     |                   |               |               |              |                                                         |             |             |           |           |              |               |        |      |
| 6-14-59                                                                                                                                                                                                                                                   | .05               | 0               | 7-3-59                                    | Rain gauge        | B-36-R        | 7-3-59        |              |                                                         |             |             |           |           |              |               |        |      |
| 6-19                                                                                                                                                                                                                                                      | .37               | T               | :31p                                      | 0                 | 0             | :31p          | 0            | 0                                                       |             |             |           |           |              |               |        |      |
| 6-20                                                                                                                                                                                                                                                      | 1.31              | .01             | :33                                       | 3.00              | .10           | :37           | .6012        | T                                                       |             |             |           |           |              |               |        |      |
| 6-21                                                                                                                                                                                                                                                      | .03               | 0               | :37                                       | 5.70              | .49           | :39           | .315         | T                                                       |             |             |           |           |              |               |        |      |
| 6-27,28                                                                                                                                                                                                                                                   | 1.93              | .04             | :39                                       | 3.10              | .75           | :42           | .750         | .03                                                     |             |             |           |           |              |               |        |      |
| 6-29                                                                                                                                                                                                                                                      | .19               | T               | :41                                       | 7.50              | 1.00          | :44           | 1.03         | .09                                                     |             |             |           |           |              |               |        |      |
| 6-30                                                                                                                                                                                                                                                      | .24               | 0               | :43                                       | 5.10              | 1.17          | :47           | 1.31         | .11                                                     |             |             |           |           |              |               |        |      |
| Watershed Conditions: Native grass meadow - 13" high, early grass ripe, in excellent condition.                                                                                                                                                           |                   |                 | :49                                       | 2.50              | 1.42          | :52           | 1.92         | .27                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :52                                       | 2.00              | 1.52          | :55           | 1.76         | .36                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :55                                       | 3.20              | 1.68          | :59           | 1.73         | .43                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | 9:01                                      | 2.00              | 1.88          | 9:01          | 1.86         | .54                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :09                                       | 3.30              | 2.32          | :04           | 1.86         | .63                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :11                                       | 2.40              | 1.40          | :09           | 2.21         | .80                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :14                                       | 3.60              | 2.53          | :12           | 2.52         | .92                                                     |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 | :16                                       | 1.50              | 2.83          | :14           | 2.15         | 1.00                                                    |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | :21           | 1.32         | 1.20                                                    |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | :24           | .981         | 1.27                                                    |             |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               | :29           | .173         | 1.32                                                    |             |             |           |           |              |               |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 3.428.                                                                                                                                                                                              |                   |                 |                                           |                   |               |               | :39          | .210                                                    | 1.39        |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               |               | :44          | .106                                                    | 1.40        |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               |               | :49          | .0525                                                   | 1.41        |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               |               | 10:04        | .0119                                                   | 1.41        |             |           |           |              |               |        |      |
|                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               |               | :51          | 0                                                       | 1.41        |             |           |           |              |               |        |      |



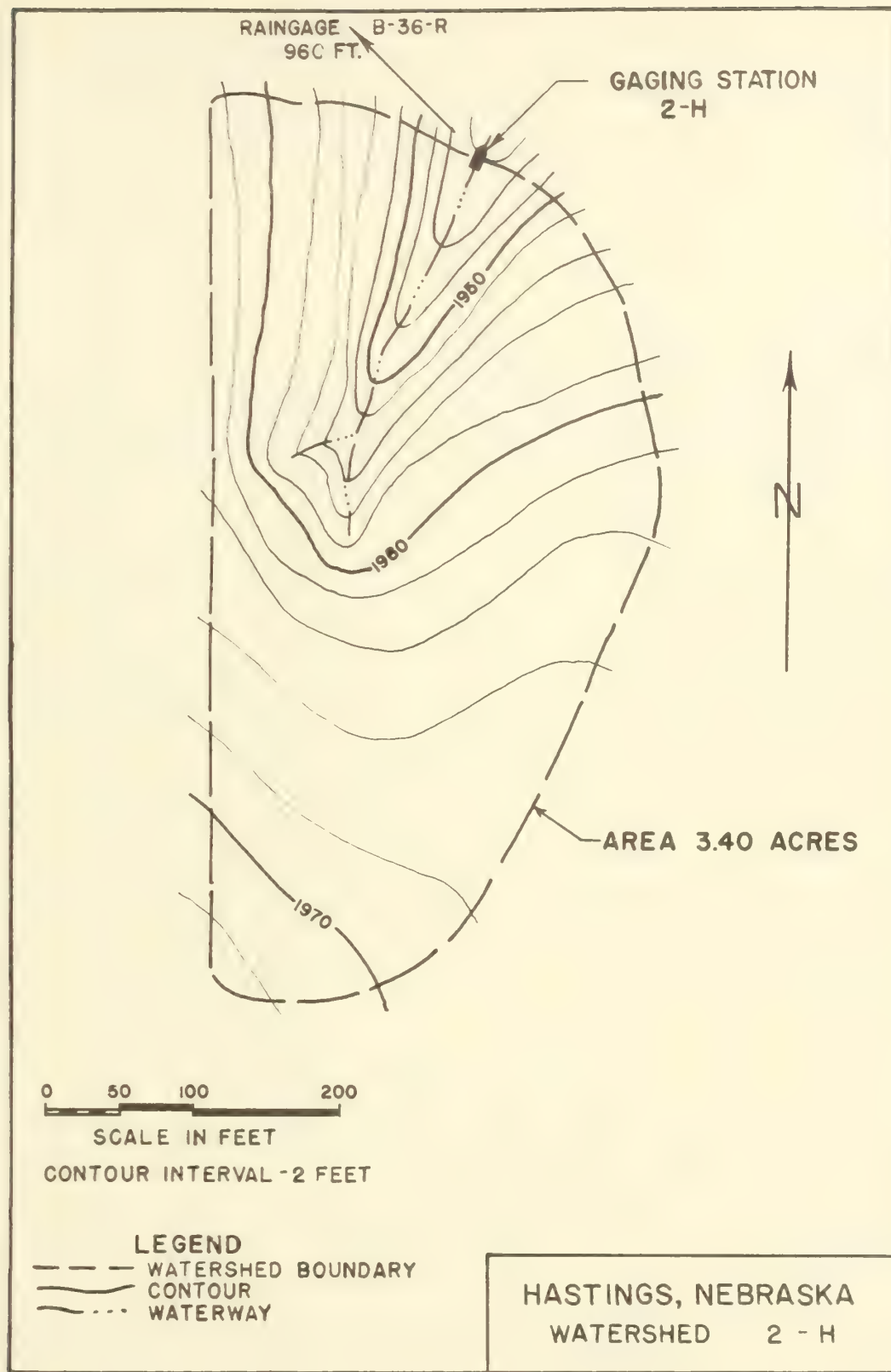


June 12, 1958



July 3, 1959

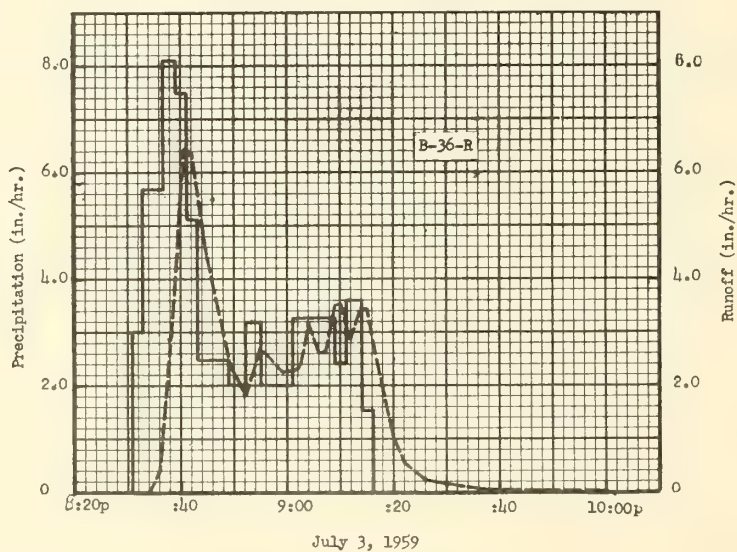
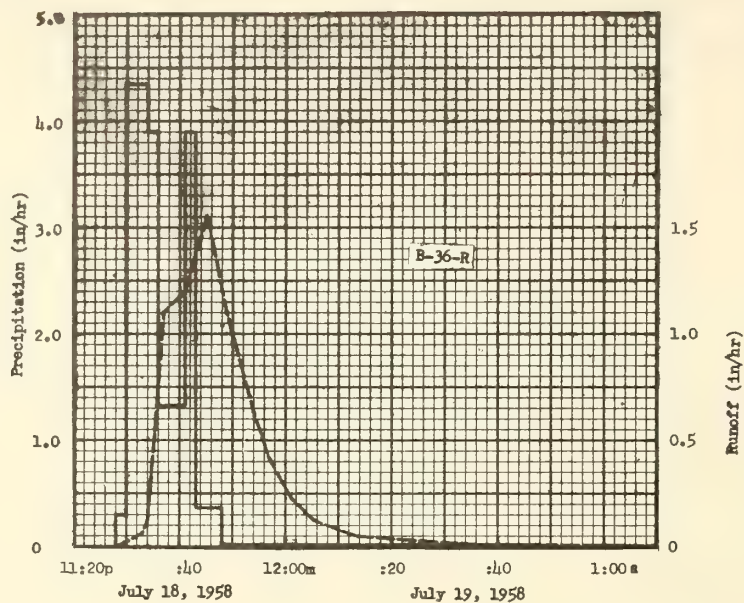
HASTINGS, NEBRASKA WATERSHED 2-H



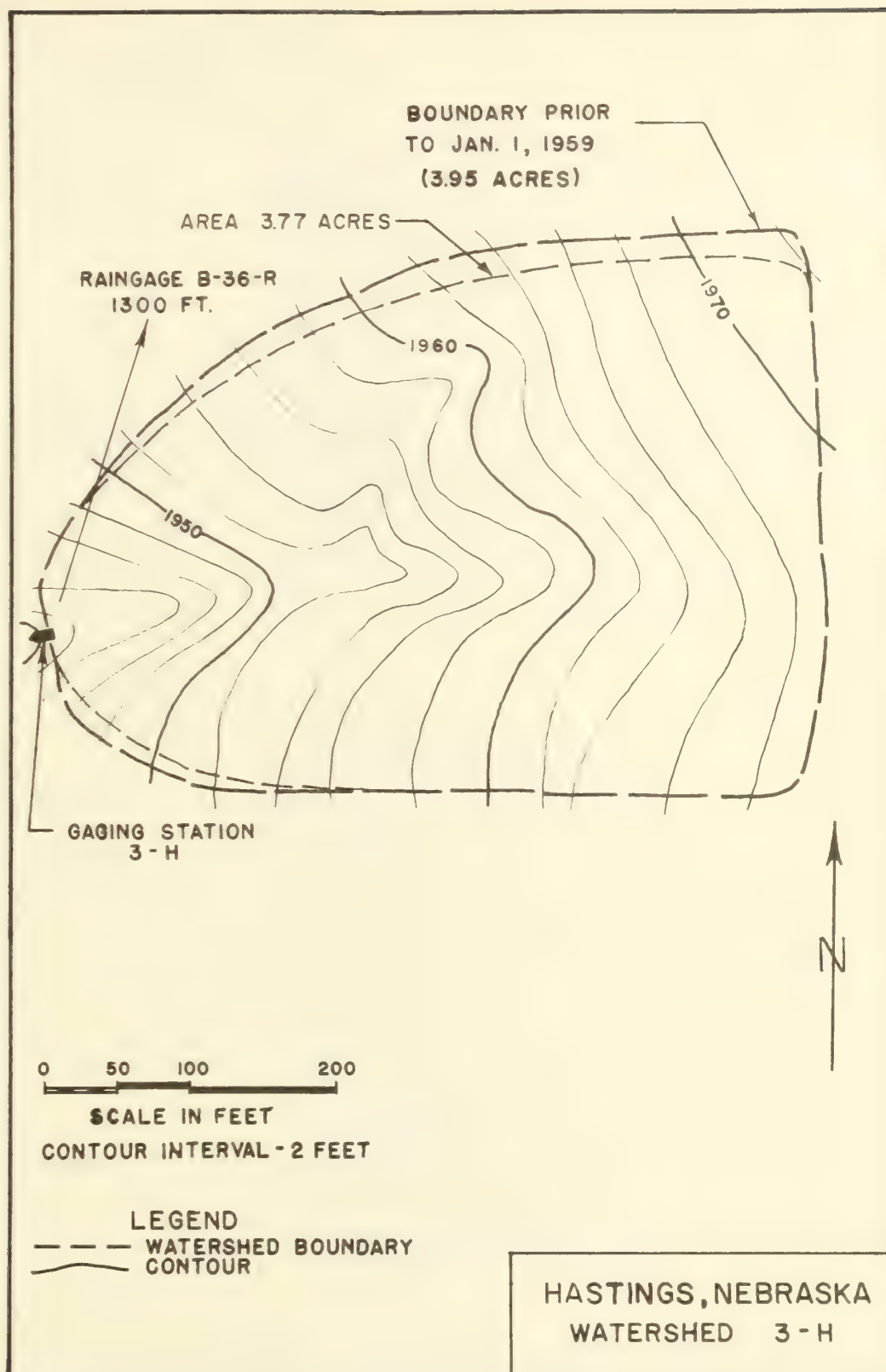
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                              |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 3-H<br>(Area - 3.95 or 3.77 acres) 1/ |             |              |             |           |           |               |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|--------------------------------------------------------------------|-------------|--------------|-------------|-----------|-----------|---------------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                          | Jan.                 | Feb.               | Mar.                                      | Apr.                 | May              | June             | July            | Aug.                                                               | Sept.       | Oct.         | Nov.        | Dec.      | Year      |               |        |      |
| 1958 2/                                                                                                                                                                                                                                                                                                                | P<br>Q               | 0.07<br>0          | 1.24<br>.03                               | 1.97<br>0            | 1.73<br>.11      | 1.50<br>0        | 2.88<br>.06     | 4.74<br>.83                                                        | 3.51<br>.61 | 1.49<br>T    | 0.08<br>0   | 0.45<br>0 | 0.03<br>0 | 19.69<br>1.64 |        |      |
| 1959                                                                                                                                                                                                                                                                                                                   | P<br>Q               | .21<br>0           | .25<br>.01                                | 3.29<br>.06          | .88<br>T         | 6.26<br>.83      | 4.89<br>1.72    | 3.12<br>2.35                                                       | 3.32<br>.22 | 4.80<br>1.27 | 1.87<br>.32 | T<br>0    | .06<br>0  | 28.95<br>6.78 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                             |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 3-H                                   |             |              |             |           |           |               |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                   | MAXIMUM<br>DISCHARGE |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                                                                    |             |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                        |                      |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                                                                    | 12 hours    |              | 1 day       |           | 2 days    |               | 8 days |      |
|                                                                                                                                                                                                                                                                                                                        | Date                 | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.                                                               | Date        | Vol.         | Date        | Vol.      | Date      | Vol.          | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                                                                                   | 7-18                 | 1.56               | 7-18                                      | .44                  | 7-18             | .45              | 8-16            | .49                                                                | 8-16        | .49          | 8-16        | .49       | 7-17      | .65           | 7-17   | .83  |
| 1959                                                                                                                                                                                                                                                                                                                   | 7-3                  | 6.45               | 7-3                                       | 2.34                 | 7-3              | 2.35             | 7-3             | 2.35                                                               | 7-3         | 2.35         | 7-3         | 2.35      | 7-3       | 2.35          | 6-28   | 3.44 |
| Notes: 2/Runoff records discontinued between 1-4-55 and 1-1-58. Quality of Records: Monthly P and Q values good except the Q values for the months of Feb., March and April which are fair. Maximum rates and volumes are good to excellent. Watershed conditions: 1958, wheat subtitled, and 1959, sorghum subtitled. |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |              |             |           |           |               |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 3-H                                   |             |              |             |           |           |               |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                  |                      |                    | Rainfall                                  |                      |                  | Runoff           |                 |                                                                    |             |              |             |           |           |               |        |      |
| Date                                                                                                                                                                                                                                                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches)                                                   |             |              |             |           |           |               |        |      |
| Event of July 18 and 19, 1958 (Area - 3.95 acres)                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |              |             |           |           |               |        |      |
| 6-20-58                                                                                                                                                                                                                                                                                                                | .20                  | 0                  | 7-18-58                                   | Rainage              | B-36-R           | 7-18-58          |                 |                                                                    |             |              |             |           |           |               |        |      |
| 6-24,25                                                                                                                                                                                                                                                                                                                | .20                  | 0                  | 11:28p                                    | 0                    | 0                | 11:28p           | 0               | 0                                                                  |             |              |             |           |           |               |        |      |
| 7-3                                                                                                                                                                                                                                                                                                                    | .95                  | T                  | :30                                       | .30                  | .01              | :33              | .0588           |                                                                    |             |              |             |           |           |               |        |      |
| 7-4                                                                                                                                                                                                                                                                                                                    | .38                  | 0                  | :34                                       | .35                  | .30              | :34              | .132            | T                                                                  |             |              |             |           |           |               |        |      |
| 7-10                                                                                                                                                                                                                                                                                                                   | .42                  | T                  | :36                                       | 3.90                 | .43              | :37              | 1.10            | .02                                                                |             |              |             |           |           |               |        |      |
| 7-12                                                                                                                                                                                                                                                                                                                   | .08                  | 0                  | :41                                       | 1.32                 | .54              | :41              | 1.20            | .11                                                                |             |              |             |           |           |               |        |      |
| 7-15                                                                                                                                                                                                                                                                                                                   | .31                  | 0                  | :43                                       | 3.90                 | .67              | :45              | 1.56            | .20                                                                |             |              |             |           |           |               |        |      |
| 7-16                                                                                                                                                                                                                                                                                                                   | .08                  | 0                  | :48                                       | .36                  | .70              | :49              | 1.10            | .29                                                                |             |              |             |           |           |               |        |      |
| 7-17                                                                                                                                                                                                                                                                                                                   | 1.07                 | .20                | 7-19-58                                   |                      |                  | :54              | .630            | .36                                                                |             |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                        |                      |                    | 12:48a                                    | .02                  | .72              | :57              | .402            | .39                                                                |             |              |             |           |           |               |        |      |
| Watershed Conditions: Wheat har-                                                                                                                                                                                                                                                                                       |                      |                    |                                           |                      |                  | 7-19-58          |                 |                                                                    |             |              |             |           |           |               |        |      |
| vested on July 8 and 9. Stubble                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | 12:01a           | .223            | .41                                                                |             |              |             |           |           |               |        |      |
| 1 ft. high.                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  | :05              | .127            | .42                                                                |             |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | :13              | .0588           | .43                                                                |             |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | :37              | .0135           | .44                                                                |             |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | 2:06 3/          | .0018           | .45                                                                |             |              |             |           |           |               |        |      |
| Event of July 3, 1959 (Area - 3.77 acres)                                                                                                                                                                                                                                                                              |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |              |             |           |           |               |        |      |
| 6-18-59                                                                                                                                                                                                                                                                                                                | .05                  | 0                  | 7-3-59                                    | Rainage              | B-36-R           | 7-3-59           |                 |                                                                    |             |              |             |           |           |               |        |      |
| 6-19                                                                                                                                                                                                                                                                                                                   | .37                  | T                  | 3:31p                                     | 0                    | 0                | 8:34p            | 0               | 0                                                                  |             |              |             |           |           |               |        |      |
| 6-20                                                                                                                                                                                                                                                                                                                   | 1.31                 | .62                | :33                                       | 3.00                 | .10              | :36              | .421            | .01                                                                |             |              |             |           |           |               |        |      |
| 6-21                                                                                                                                                                                                                                                                                                                   | .03                  | 0                  | :37                                       | 5.70                 | .48              | :38              | 2.87            | .06                                                                |             |              |             |           |           |               |        |      |
| 6-27,28                                                                                                                                                                                                                                                                                                                | 1.93                 | 1.04               | :39                                       | 8.10                 | .75              | :41              | 6.45            | .31                                                                |             |              |             |           |           |               |        |      |
| 6-29                                                                                                                                                                                                                                                                                                                   | .19                  | .02                | :41                                       | 7.50                 | 1.00             | :42              | 6.39            | .41                                                                |             |              |             |           |           |               |        |      |
| 6-30                                                                                                                                                                                                                                                                                                                   | .22                  | .03                | :43                                       | 5.10                 | 1.17             | :45              | 4.39            | .69                                                                |             |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                        |                      |                    | :49                                       | 2.50                 | 1.42             | :49              | 2.45            | .92                                                                |             |              |             |           |           |               |        |      |
| Watershed Conditions: Sorghum -                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | :52              | 1.85            | 1.03                                                               |             |              |             |           |           |               |        |      |
| about 6" high and in good condition.                                                                                                                                                                                                                                                                                   |                      |                    |                                           |                      |                  | :55              | 2.74            | 1.14                                                               |             |              |             |           |           |               |        |      |
| Weeds beginning to grow. Last field                                                                                                                                                                                                                                                                                    |                      |                    |                                           |                      |                  | 9:01             | 2.27            | 1.30                                                               |             |              |             |           |           |               |        |      |
| operations on June 16.                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | :09              | 2.27            | 1.38                                                               |             |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                        |                      |                    | :11                                       | 3.30                 | 2.32             | 9:01             | 2.31            | 1.42                                                               |             |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                        |                      |                    | :14                                       | 2.40                 | 2.40             | :02              | 2.31            | 1.42                                                               |             |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           | 3.60                 | 2.58             | :04              | 3.19            | 1.51                                                               |             |              |             |           |           |               |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 3.983 for event of July 18-19, 1958; by 3.802 for event of July 3, 1959. 1/ Area changed 1-1-58 from 3.95 acres to 3.77 acres. 3/ Beginning of new runoff event.                                                                                                 |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |              |             |           |           |               |        |      |

| SELECTED RUNOFF EVENTS                   |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed 3-H |                 |                  |
|------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                    |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                     | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| <u>Event of July 3, 1959 - Continued</u> |                      |                    |                  |                      |                  |                                  |                 |                  |
|                                          |                      |                    | 9:16p            | 1.50                 | 2.63             | 9:06p                            | 2.61            | 1.61             |
|                                          |                      |                    |                  |                      |                  | :07                              | 2.67            | 1.65             |
|                                          |                      |                    |                  |                      |                  | :09                              | 3.52            | 1.75             |
|                                          |                      |                    |                  |                      |                  | :10                              | 3.52            | 1.81             |
|                                          |                      |                    |                  |                      |                  | :12                              | 2.37            | 1.92             |
|                                          |                      |                    |                  |                      |                  | :14                              | 3.15            | 2.02             |
|                                          |                      |                    |                  |                      |                  | :15                              | 3.45            | 2.08             |
|                                          |                      |                    |                  |                      |                  | :20                              | 1.09            | 2.27             |
|                                          |                      |                    |                  |                      |                  | :22                              | .502            | 2.29             |
|                                          |                      |                    |                  |                      |                  | :26                              | .250            | 2.32             |
|                                          |                      |                    |                  |                      |                  | :30                              | .151            | 2.33             |
|                                          |                      |                    |                  |                      |                  | :37                              | .0616           | 2.34             |
|                                          |                      |                    |                  |                      |                  | 10:00                            | .0092           | 2.35             |
|                                          |                      |                    |                  |                      |                  | :45                              |                 | 2.35             |
| Notes:                                   |                      |                    |                  |                      |                  |                                  |                 |                  |

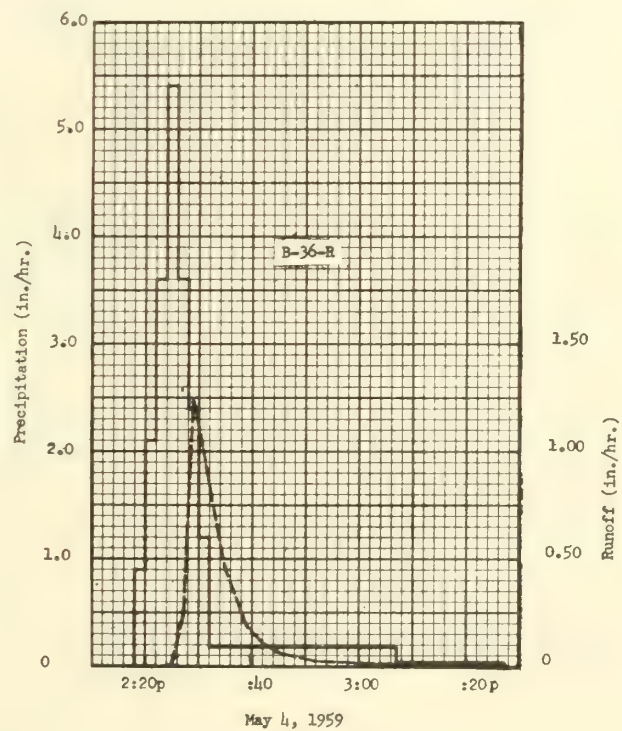
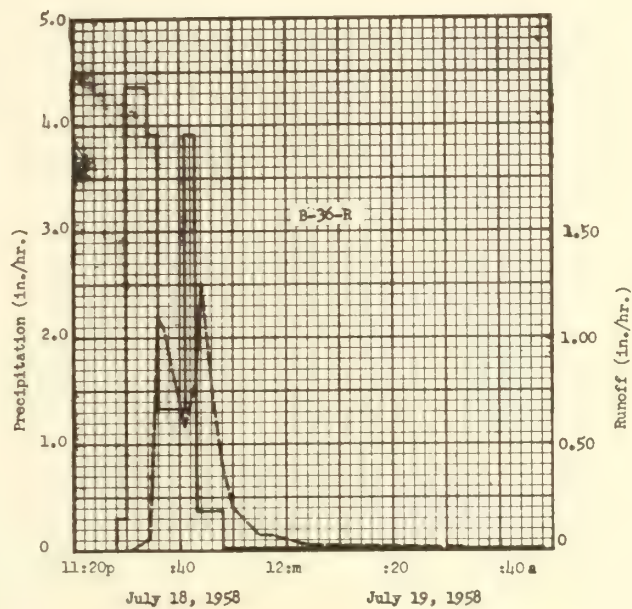




HASTINGS, NEBRASKA WATERSHED 3-H

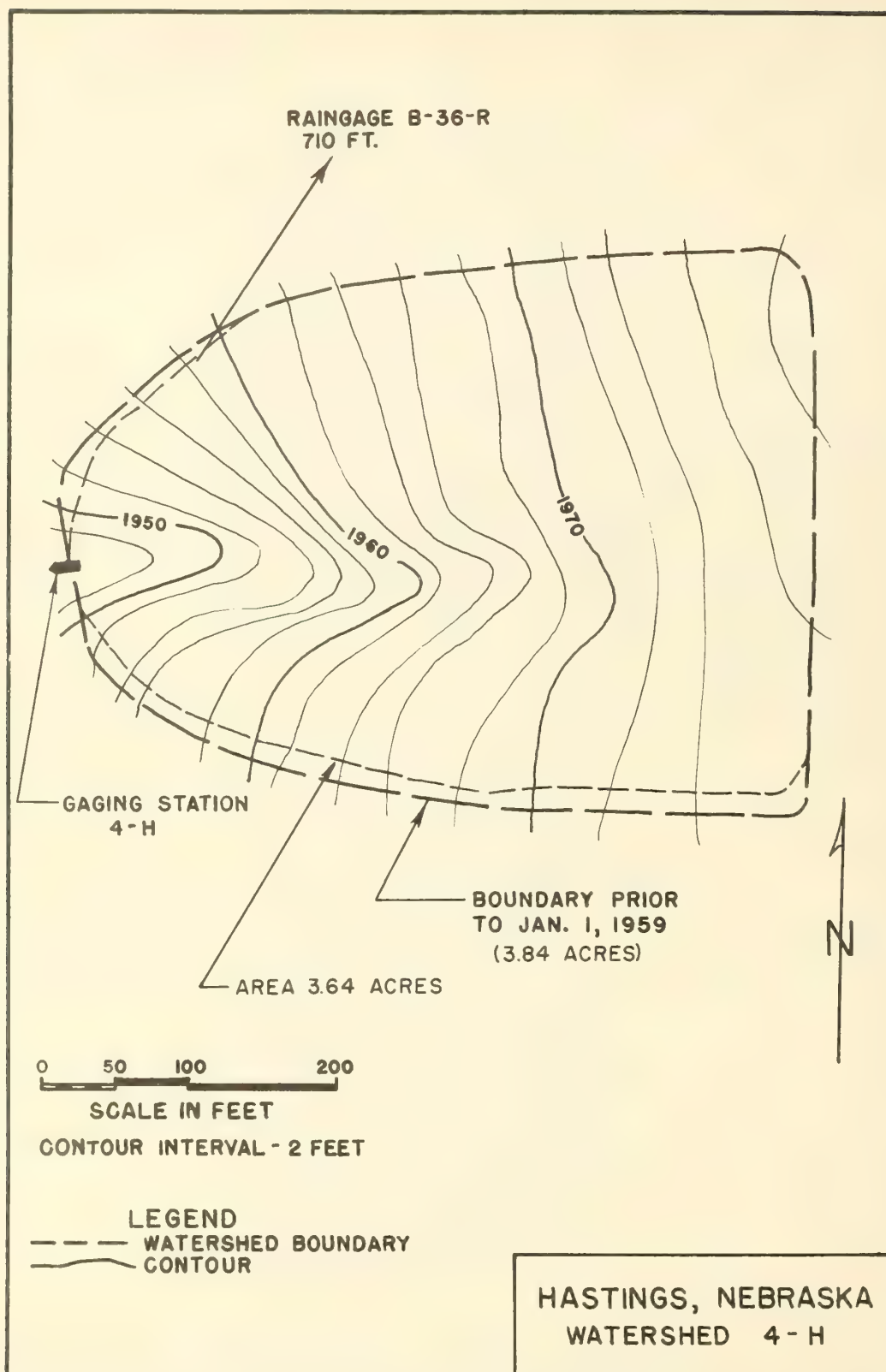


| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                   |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 4-H<br>(Area - 3.84 or 3.64 acres) 1/ |              |             |           |           |               |      |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|--------------------------------------------------------------------|--------------|-------------|-----------|-----------|---------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                               | Jan.                 | Feb.               | Mar.                                      | Apr.                 | May              | June             | July            | Aug.                                                               | Sept.        | Oct.        | Nov.      | Dec.      | Year          |      |        |      |
| 1958 2/ P<br>Q                                                                                                                                                                                                                                                                                                                                              | 0.07<br>0            | 1.24<br>.01        | 1.97<br>0                                 | 1.73<br>.03          | 1.50<br>0        | 2.88<br>.09      | 4.74<br>.38     | 3.51<br>.03                                                        | 1.49<br>0    | 0.08<br>0   | 0.45<br>0 | 0.03<br>0 | 19.69<br>.54  |      |        |      |
| 1959 P<br>Q                                                                                                                                                                                                                                                                                                                                                 | .21<br>0             | .25<br>.01         | 3.29<br>.24                               | .88<br>.03           | 6.26<br>2.01     | 4.89<br>1.03     | 3.12<br>2.15    | 3.32<br>.53                                                        | 4.80<br>2.54 | 1.87<br>.73 | T<br>0    | .06<br>0  | 28.95<br>9.27 |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                  |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 4-H 3/                                |              |             |           |           |               |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                        | MAXIMUM<br>DISCHARGE |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                                                                    |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                                                                    | 12 hours     |             | 1 day     |           | 2 days        |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                             | Date                 | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.                                                               | Date         | Vol.        | Date      | Vol.      | Date          | Vol. | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                                                                                                                        | 7-18                 | 1.25               | 7-18                                      | .22                  | 7-18             | .23              | 7-18            | .23                                                                | 7-18         | .23         | 7-18      | .23       | 7-17          | .27  | 7-17   | .38  |
| 1959                                                                                                                                                                                                                                                                                                                                                        | 7-3                  | 4.50               | 7-3                                       | 2.15                 | 7-3              | 2.15             | 7-3             | 2.15                                                               | 7-3          | 2.15        | 7-3       | 2.15      | 7-3           | 2.15 | 6-28   | 2.88 |
| Notes: 2/ Runoff records discontinued between 1-4-55 and 1-1-58. Quality of Records: Monthly P and Q, maximum rates and volumes - good to excellent. Estimated values are fair. Watershed conditions: 1958, sorghum subtitled; 1959 - fallow subtitled. e - estimated or partially estimated. 3/ Correction: Maximum Discharge, Rate, 1941, should be 1.19. |                      |                    |                                           |                      |                  |                  |                 |                                                                    |              |             |           |           |               |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 4-H                                   |              |             |           |           |               |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                       |                      |                    | Rainfall                                  |                      |                  | Runoff           |                 |                                                                    |              |             |           |           |               |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                        | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches)                                                   |              |             |           |           |               |      |        |      |
| Event of July 18 and 19, 1958 (Area - 3.84 acres)                                                                                                                                                                                                                                                                                                           |                      |                    |                                           |                      |                  |                  |                 |                                                                    |              |             |           |           |               |      |        |      |
| 6-20-58                                                                                                                                                                                                                                                                                                                                                     | .30                  | 0                  | 7-18-58                                   | Rain gauge           | B-36-R           | 7-18-58          |                 |                                                                    |              |             |           |           |               |      |        |      |
| 6-24,25                                                                                                                                                                                                                                                                                                                                                     | .20                  | 0                  | 11:20p                                    | 0                    | 0                | 11:31p           | 0               | 0                                                                  |              |             |           |           |               |      |        |      |
| 7-3                                                                                                                                                                                                                                                                                                                                                         | .95                  | 0                  | :30                                       | .30                  | .01              | :34              | .0604           | T                                                                  |              |             |           |           |               |      |        |      |
| 7-4                                                                                                                                                                                                                                                                                                                                                         | .38                  | 0                  | :34                                       | 4.35                 | .30              | :36              | 1.09            | .02                                                                |              |             |           |           |               |      |        |      |
| 7-10                                                                                                                                                                                                                                                                                                                                                        | .42                  | T                  | :36                                       | 3.90                 | .43              | :37              | 1.05            | .04                                                                |              |             |           |           |               |      |        |      |
| 7-12                                                                                                                                                                                                                                                                                                                                                        | .08                  | 0                  | :41                                       | 1.32                 | .54              | :38              | .930            | .06                                                                |              |             |           |           |               |      |        |      |
| 7-15                                                                                                                                                                                                                                                                                                                                                        | .31                  | 0                  | :43                                       | 3.90                 | .67              | :41              | .581            | .10                                                                |              |             |           |           |               |      |        |      |
| 7-16                                                                                                                                                                                                                                                                                                                                                        | .08                  | 0                  | :48                                       | .36                  | .71              | :43              | .783            | .12                                                                |              |             |           |           |               |      |        |      |
| 7-17                                                                                                                                                                                                                                                                                                                                                        | 1.07                 | .04                | 7-19-58                                   |                      |                  | :44              | 1.25            | .13                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | 12:48a                                    | .02                  | .72              | :45              | .752            | .17                                                                |              |             |           |           |               |      |        |      |
| Watershed Conditions: Sorghum - about 1' high, in good condition. Crop was replanted about June 27. Went over the field with a treader on July 8.                                                                                                                                                                                                           |                      |                    |                                           |                      |                  |                  |                 |                                                                    |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :46              | .413            | .19                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :50              | .200            | .20                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :55              | .0765           | .21                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :57              | .0765           | .21                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | 7-19-58          |                 |                                                                    |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | 12:03a           | .0346           | .22                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :33              | .0105           | .22                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | 1:30             | 0               | .23                                                                |              |             |           |           |               |      |        |      |
| Event of May 4, 1959 (Area - 3.64 acres)                                                                                                                                                                                                                                                                                                                    |                      |                    |                                           |                      |                  |                  |                 |                                                                    |              |             |           |           |               |      |        |      |
| 4-10-59                                                                                                                                                                                                                                                                                                                                                     | .02                  | 0                  | 5-4-59                                    | Rain gauge           | B-36-R           | 5-4-59           |                 |                                                                    |              |             |           |           |               |      |        |      |
| 4-17                                                                                                                                                                                                                                                                                                                                                        | .34                  | 0                  | 2:13p                                     | 0                    | 0                | 2:25p            | 0               | 0                                                                  |              |             |           |           |               |      |        |      |
| 4-19                                                                                                                                                                                                                                                                                                                                                        | .51                  | .03                | :20                                       | .90                  | .03              | :27              | .243            | T                                                                  |              |             |           |           |               |      |        |      |
| 5-2                                                                                                                                                                                                                                                                                                                                                         | .25                  | 0                  | :22                                       | 2.10                 | .10              | :29              | 1.23            | .03                                                                |              |             |           |           |               |      |        |      |
| 5-3                                                                                                                                                                                                                                                                                                                                                         | .14                  | 0                  | :24                                       | 2.50                 | .22              | :31              | .997            | .07                                                                |              |             |           |           |               |      |        |      |
| Watershed Conditions: Fallow - good residue cover.                                                                                                                                                                                                                                                                                                          |                      |                    |                                           |                      |                  |                  |                 |                                                                    |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :26                                       | 5.40                 | .40              | :35              | .461            | .11                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :23                                       | 3.60                 | .52              | :39              | .196            | .13                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :30                                       | 2.40                 | .60              | :42              | .110            | .14                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :32                                       | 1.20                 | .64              | :45              | .0637           | .15                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | 3:07                                      | .19                  | .75              | :52              | .0236           | .15                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | :27                                       | .03                  | .76              | 3:09             | .0095           | .16                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | 4:30                                      | 0                    | .76              | :49              | .0051           | .16                                                                |              |             |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                             |                      |                    | 5:50                                      | .06                  | .84              | 5:49             | 0               | .16                                                                |              |             |           |           |               |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 3.872 for event of 7-18 and 19-58; by 3.670 for event of May 4, 1959. 1/ Area changed 1-1-59 from 3.84 acres to 3.64 acres.                                                                                                                                                                           |                      |                    |                                           |                      |                  |                  |                 |                                                                    |              |             |           |           |               |      |        |      |



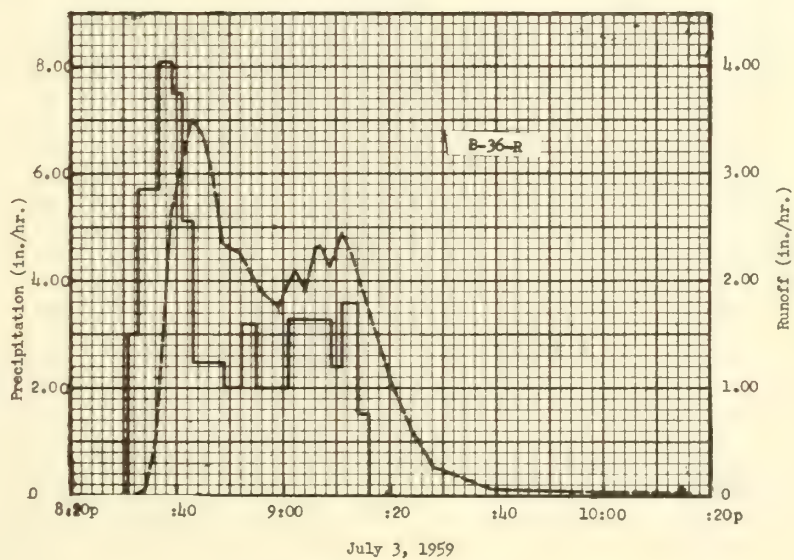
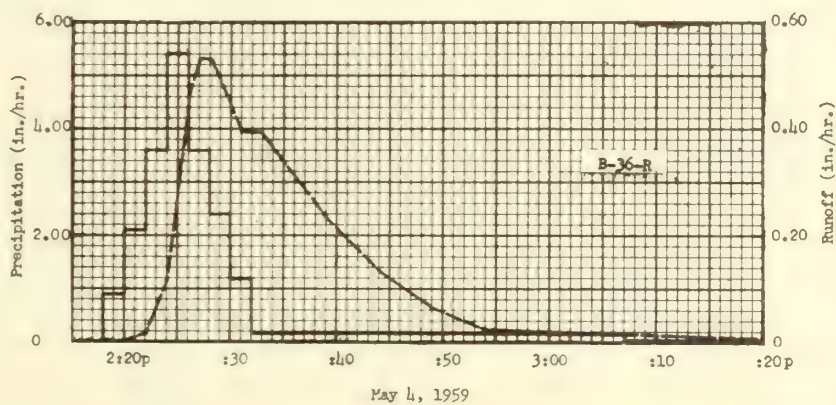
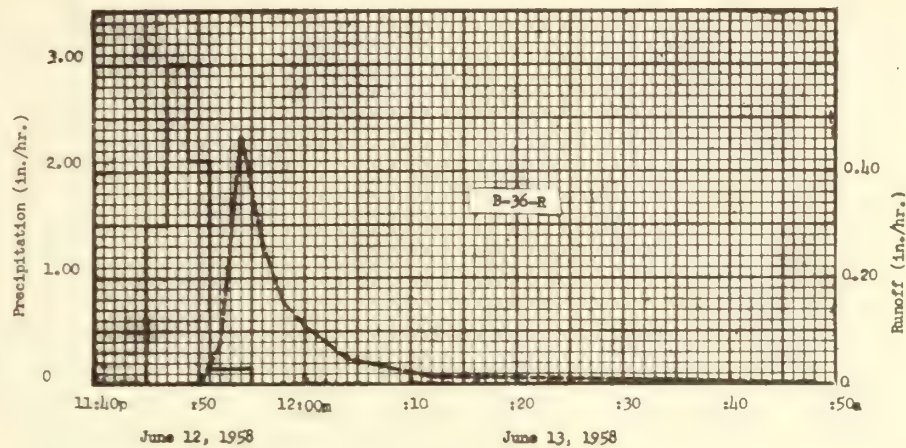
HASTINGS, NEBRASKA WATERSHED 4-H





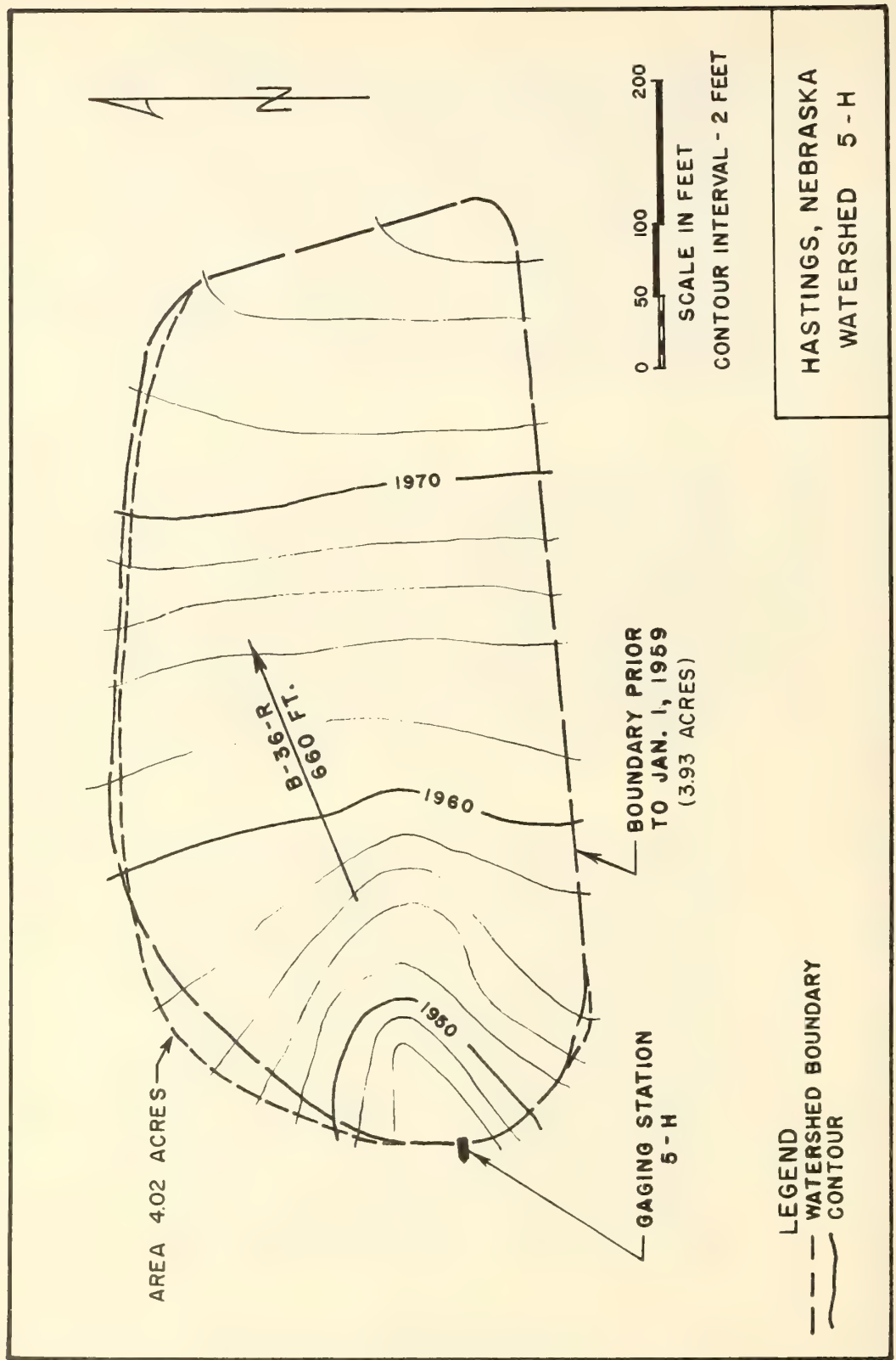
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                              |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 5-H<br>(Area - 3.93 or 4.02 acres) 1/ |             |             |           |           |           |               |        |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|--------------------------------------------------------------------|-------------|-------------|-----------|-----------|-----------|---------------|--------|------|
| Year                                                                                                                                                                                                                                                                                                                                                                                   | Month                | Jan.               | Feb.                                      | Mar.                 | Apr.             | May              | June            | July                                                               | Aug.        | Sept.       | Oct.      | Nov.      | Dec.      | Year          |        |      |
| 1956                                                                                                                                                                                                                                                                                                                                                                                   | P<br>Q               | 0.18<br>e          | 0.08<br>T                                 | 0.30<br>0            | 1.10<br>0        | 0.56<br>0        | 4.22<br>.67     | 2.68<br>.07                                                        | 1.59<br>.05 | 1.24<br>.02 | 0.81<br>T | 0.10<br>0 | 0.05<br>0 | 12.91<br>.81  |        |      |
| 1958 2/                                                                                                                                                                                                                                                                                                                                                                                | P<br>Q               | 0.07<br>0          | 1.24<br>.02                               | 1.97<br>0            | 1.73<br>.13      | 1.50<br>.01      | 2.88<br>.23     | 1.74<br>.49                                                        | 3.51<br>.18 | 1.49<br>.02 | 0.08<br>0 | 0.45<br>0 | 0.03<br>0 | 19.69<br>1.08 |        |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                                   | P<br>Q               | .21<br>e           | .25<br>e                                  | 3.29<br>.24          | .88<br>.02       | 6.26<br>1.46     | 4.89<br>.52     | 3.12<br>1.77                                                       | 3.32<br>.27 | 4.80<br>.19 | 1.87<br>T | T<br>0    | .06<br>0  | 28.95<br>4.54 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 5-H                                   |             |             |           |           |           |               |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                   | MAXIMUM<br>DISCHARGE |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                                                                    |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                                                                    | 12 hours    |             | 1 day     |           | 2 days    |               | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                        | Date                 | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.                                                               | Date        | Vol.        | Date      | Vol.      | Date      | Vol.          | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                                                                                                                                                   | 7-18                 | 1.43               | 7-18                                      | .30                  | 7-18             | .30              | 7-18            | .30                                                                | 7-18        | .30         | 7-18      | .30       | 7-17      | .34           | 7-17   | .49  |
| 1959                                                                                                                                                                                                                                                                                                                                                                                   | 7-3                  | 3.50               | 7-3                                       | 1.75                 | 7-3              | 1.77             | 7-3             | 1.77                                                               | 7-3         | 1.77        | 7-3       | 1.77      | 7-3       | 1.77          | 6-28   | 2.20 |
| Notes: 2/ Runoff records discontinued between 1-7-57 and 1-8-58. Quality of records: Monthly P and Q, Annual maximum discharges and volumes excellent except those which are estimated which are fair. Watershed Conditions: 1956 - corn, straw, not-row; 1958 - fallow, stubbled; 1959 - wheat, stubbled. Crop poor in 1956; very good in 1959. e - estimated or partially estimated. |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |             |           |           |           |               |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 5-H                                   |             |             |           |           |           |               |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                  |                      |                    | Rainfall                                  |                      |                  | Runoff           |                 |                                                                    |             |             |           |           |           |               |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches)                                                   |             |             |           |           |           |               |        |      |
| Event of June 12 and 13, 1958 (Area - 3.93 acres)                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |             |           |           |           |               |        |      |
| 5-11-58                                                                                                                                                                                                                                                                                                                                                                                | .52                  | .01                | 6-11-58                                   | Rain gauge           | B-36-R           | 6-12-58          |                 |                                                                    |             |             |           |           |           |               |        |      |
| 5-15                                                                                                                                                                                                                                                                                                                                                                                   | .22                  | 0                  | 11:45                                     | 0                    | C                | 11:50p           | 0               |                                                                    |             |             |           |           |           |               |        |      |
| 5-16                                                                                                                                                                                                                                                                                                                                                                                   | .25                  | T                  | :47                                       | 1.50                 | .05              | :52              | .0787           |                                                                    |             |             |           |           |           |               |        |      |
| 5-26                                                                                                                                                                                                                                                                                                                                                                                   | .30                  | 0                  | :49                                       | 3.00                 | .15              | :54              | .469            | .01                                                                |             |             |           |           |           |               |        |      |
| 5-27                                                                                                                                                                                                                                                                                                                                                                                   | .15                  | 0                  | :51                                       | 2.10                 | .22              | :56              | .255            | .02                                                                |             |             |           |           |           |               |        |      |
| 6-8                                                                                                                                                                                                                                                                                                                                                                                    | .12                  |                    | :55                                       | .15                  | .23              | :58              | .156            | .03                                                                |             |             |           |           |           |               |        |      |
| 6-12 2/                                                                                                                                                                                                                                                                                                                                                                                | 1.72                 | .19                |                                           |                      |                  | 12:00m           | .111            | .03                                                                |             |             |           |           |           |               |        |      |
| Watershed Conditions: Fallow - last field operation May 22 with the 7-ft. sweep to kill weeds. Little cover at time of storm.                                                                                                                                                                                                                                                          |                      |                    |                                           |                      |                  | 6-13-58          |                 |                                                                    |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | 12:04a           | .0522           | .04                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | :12              | .0154           | .04                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | :55              | 0               | .05                                                                |             |             |           |           |           |               |        |      |
| Event of May 4, 1959 (Area - 4.02 acres)                                                                                                                                                                                                                                                                                                                                               |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |             |           |           |           |               |        |      |
| 4-10-59                                                                                                                                                                                                                                                                                                                                                                                | .02                  | 0                  | 5-4-59                                    | Rain gauge           | B-36-R           | 5-4-59           |                 |                                                                    |             |             |           |           |           |               |        |      |
| 4-17                                                                                                                                                                                                                                                                                                                                                                                   | .34                  | 0                  | 2:18p                                     | 0                    | 0                | 2:20p            | 0               |                                                                    |             |             |           |           |           |               |        |      |
| 4-19                                                                                                                                                                                                                                                                                                                                                                                   | .51                  | .02                | :20                                       | .90                  | .03              | :22              | .0189           | 0                                                                  |             |             |           |           |           |               |        |      |
| 5-2                                                                                                                                                                                                                                                                                                                                                                                    | .25                  | 0                  | :22                                       | 2.10                 | .10              | :24              | .119            | T                                                                  |             |             |           |           |           |               |        |      |
| 5-3                                                                                                                                                                                                                                                                                                                                                                                    | .14                  | 0                  | :24                                       | 3.60                 | .22              | :26              | .471            | .01                                                                |             |             |           |           |           |               |        |      |
| Watershed Conditions: Wheat - 5" high and in good condition.                                                                                                                                                                                                                                                                                                                           |                      |                    |                                           |                      |                  | :26              | .540            | .02                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    | :28                                       | 3.60                 | .32              | :28              | .531            | .03                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    | :30                                       | 2.40                 | .60              | :31              | .345            | .05                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    | :32                                       | 1.20                 | .64              | :33              | .395            | .07                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    | 3:07                                      | .19                  | .75              | :39              | .235            | .10                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    | :27                                       | .03                  | .74              | :44              | .136            | .11                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | :49              | .0651           | .12                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | :54              | .0279           | .13                                                                |             |             |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  | 3:34             | 0               | .13                                                                |             |             |           |           |           |               |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 3.963 for event of June 12-13, 1958; by 4.054 for event of May 4, 1959. 1/ Area changed 1-1-58 from 3.93 acres to 4.02 acres. 3/ Rainfall and runoff prior to event beginning 11:45p on 6-12-58.                                                                                                                                 |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |             |           |           |           |               |        |      |

| SELECTED RUNOFF EVENTS                                                                 |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed 5-H |                 |                  |
|----------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                  |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 3, 1959 (Area - 4.02 acres)                                              |                      |                    |                  |                      |                  |                                  |                 |                  |
| 6-18-59                                                                                | .05                  | 0                  | 7-3-59           | Rainage              | E-36-R           | 7-3-59                           |                 |                  |
| 6-19                                                                                   | .37                  | 0                  | 8:31p            | 0                    | 0                | 8:32 p                           | 0               | 0                |
| 6-20                                                                                   | 1.31                 | .02                | :33              | 3.00                 | .10              | :34                              | .0578           | T                |
| 6-21                                                                                   | .03                  | 0                  | :37              | 5.70                 | .48              | :36                              | .508            | .01              |
| 6-27,28                                                                                | 1.93                 | .42                | :39              | 8.10                 | .75              | :39                              | 2.64            | .09              |
| 6-29                                                                                   | .19                  | T                  | :41              | 7.50                 | 1.00             | :41                              | 3.03            | .19              |
| 6-30                                                                                   | .22                  | 0                  | :43              | 5.10                 | 1.17             | :43                              | 3.50            | .30              |
| Watershed Conditions: Wheat - 3' high.<br>Ripe and ready to cut. Good stand.           |                      |                    | :49              | 2.50                 | 1.42             | :45                              | 3.35            | .41              |
|                                                                                        |                      |                    | :52              | 2.00                 | 1.52             | :47                              | 2.96            | .52              |
|                                                                                        |                      |                    | :55              | 3.20                 | 1.68             | :49                              | 2.34            | .60              |
|                                                                                        |                      |                    | 9:01             | 2.00                 | 1.88             | :52                              | 2.25            | .72              |
|                                                                                        |                      |                    | :09              | 3.30                 | 2.32             | :56                              | 1.92            | .86              |
|                                                                                        |                      |                    | :11              | 2.40                 | 2.40             | :59                              | 1.77            | .95              |
|                                                                                        |                      |                    | :14              | 3.60                 | 2.59             | 9:02                             | 2.10            | 1.05             |
|                                                                                        |                      |                    | :10              | 1.50                 | 2.63             | :04                              | 1.90            | 1.11             |
|                                                                                        |                      |                    |                  |                      |                  | :06                              | 2.30            | 1.18             |
|                                                                                        |                      |                    |                  |                      |                  | :07                              | 2.34            | 1.22             |
|                                                                                        |                      |                    |                  |                      |                  | :09                              | 2.13            | 1.30             |
|                                                                                        |                      |                    |                  |                      |                  | :11                              | 2.45            | 1.37             |
|                                                                                        |                      |                    |                  |                      |                  | :13                              | 2.22            | 1.45             |
|                                                                                        |                      |                    |                  |                      |                  | :20                              | 1.10            | 1.54             |
|                                                                                        |                      |                    |                  |                      |                  | :24                              | .620            | 1.70             |
|                                                                                        |                      |                    |                  |                      |                  | :28                              | .284            | 1.73             |
|                                                                                        |                      |                    |                  |                      |                  | :30                              | .249            | 1.74             |
|                                                                                        |                      |                    |                  |                      |                  | :39                              | .0770           | 1.76             |
|                                                                                        |                      |                    |                  |                      |                  | :53                              | .0116           | 1.77             |
|                                                                                        |                      |                    |                  |                      |                  | 11:04                            | 0               | 1.81             |
| Notes: To convert runoff in in/hr to cfs, multiply by 4.054 for event of July 3, 1959. |                      |                    |                  |                      |                  |                                  |                 |                  |



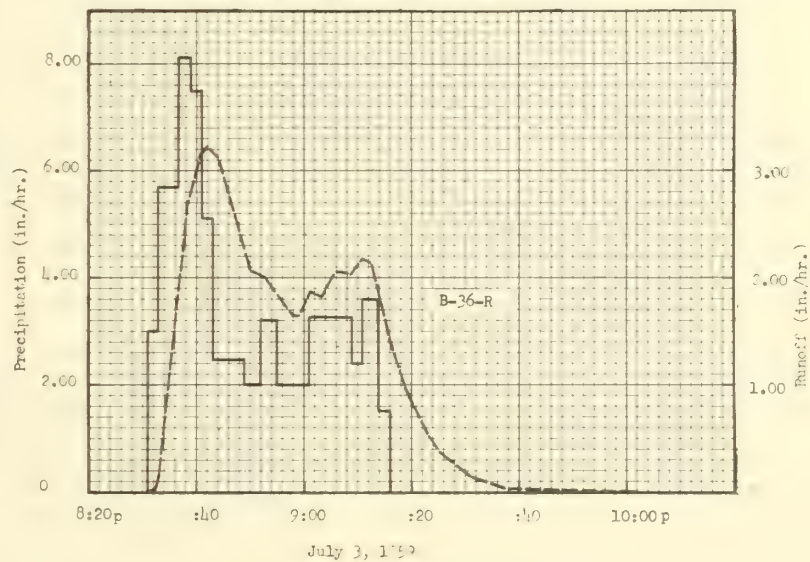
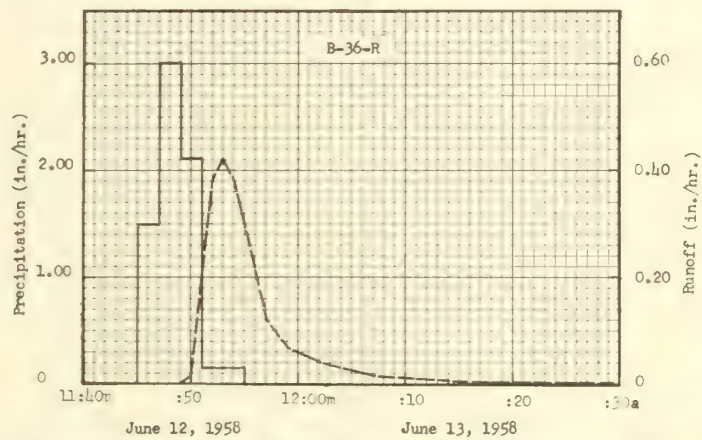
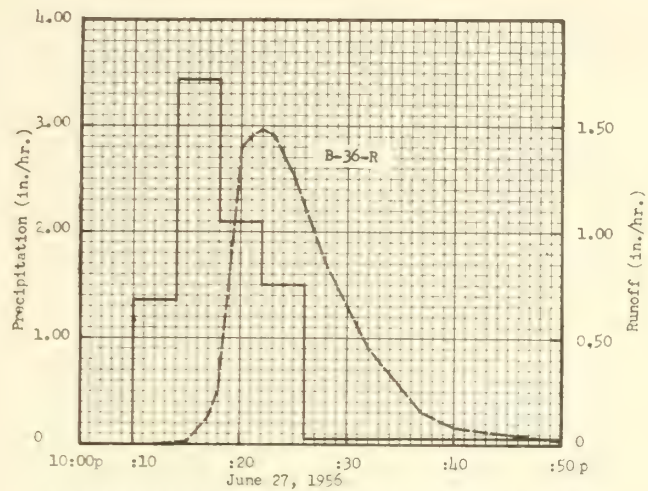
HASTINGS, NEBRASKA WATERSHED 5-H





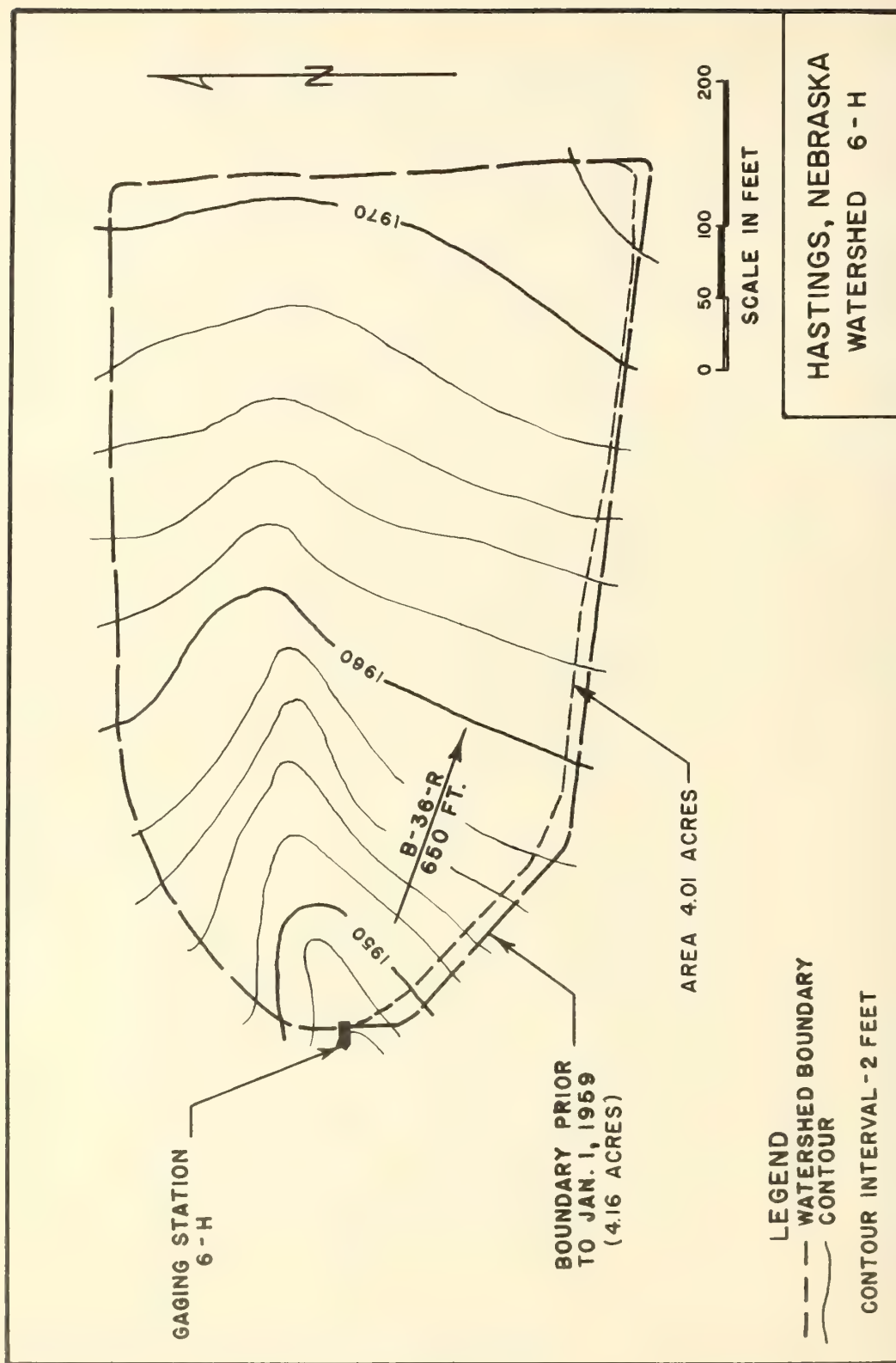
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  |                  |                 |                  | Hastings, Nebraska Watershed 6-H<br>(Area - 4.16 or 4.01 acres) 1/ |             |             |           |           |               |        |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|------------------|--------------------------------------------------------------------|-------------|-------------|-----------|-----------|---------------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                                                        |                      | Jan.               | Feb.                                      | Mar.                 | Apr.             | May              | June            | July             | Aug.                                                               | Sept.       | Oct.        | Nov.      | Dec.      | Year          |        |      |
| 1956                                                                                                                                                                                                                                                                                                                                                                                                                                 | P<br>Q               | 0.18<br>0          | 0.08<br>T                                 | 0.30<br>0            | 1.10<br>.02      | 0.56<br>0        | 4.22<br>.97     | 2.68<br>.17      | 1.59<br>.14                                                        | 1.24<br>.05 | 0.81<br>.01 | 0.10<br>0 | 0.05<br>0 | 12.91<br>1.36 |        |      |
| 1958 2/                                                                                                                                                                                                                                                                                                                                                                                                                              | P<br>Q               | 0.07<br>0          | 1.24<br>.02                               | 1.97<br>0            | 1.73<br>.17      | 1.50<br>.03      | 2.88<br>.18     | 4.74<br>.50      | 3.51<br>.22                                                        | 1.49<br>.01 | .08<br>0    | .45<br>0  | .03<br>0  | 19.69<br>1.13 |        |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                 | P<br>Q               | 0.21<br>0          | .25<br>e .08                              | 3.29<br>.19          | .88<br>.01       | 6.26<br>1.39     | 4.89<br>.48     | 3.12<br>1.66     | 3.32<br>.21                                                        | 4.80<br>.10 | 1.87<br>0   | T<br>0    | .06<br>0  | 28.95<br>4.12 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                                           |                      |                    |                                           |                      |                  |                  |                 |                  | Hastings, Nebraska Watershed 6-H 3/                                |             |             |           |           |               |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                                                 | MAXIMUM<br>DISCHARGE |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                  |                                                                    |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                  | 12 hours                                                           |             | 1 day       |           | 2 days    |               | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      | Date                 | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.             | Date                                                               | Vol.        | Date        | Vol.      | Date      | Vol.          | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                 | 7-18                 | 1.48               | 7-18                                      | .29                  | 7-18             | .30              | 7-18            | .30              | 7-18                                                               | .30         | 7-18        | .30       | 7-17      | .36           | 7-17   | .50  |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                 | 7-3                  | 3.24               | 7-3                                       | 1.65                 | 7-3              | 1.66             | 7-3             | 1.66             | 7-3                                                                | 1.66        | 7-3         | 1.66      | 7-3       | 1.66          | 6-28   | 2.06 |
| Notes: 2/Runoff records discontinued between 1-7-57 and 1-8-58. Quality of Records: P - Excellent; Q - Excellent except those which are estimated which are fair. Watershed Conditions: 1956 - wheat, straight-row; 1958 - fallow, subtitled; 1959 - wheat, subtitled. Crop poor in 1956; very good in 1959. e - estimated or partially estimated.<br>3/Correction: Maximum Discharge, Date and Rate, 1947, should be 6-25 and 1.23. |                      |                    |                                           |                      |                  |                  |                 |                  |                                                                    |             |             |           |           |               |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                               |                      |                    |                                           |                      |                  |                  |                 |                  | Hastings, Nebraska Watershed 6-H                                   |             |             |           |           |               |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                    | Rainfall                                  |                      |                  |                  |                 |                  | Runoff                                                             |             |             |           |           |               |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                 | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |                                                                    |             |             |           |           |               |        |      |
| Event of June 27, 1956 (Area - 4.16 acres)                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    |                                           |                      |                  |                  |                 |                  |                                                                    |             |             |           |           |               |        |      |
| 5-31-56                                                                                                                                                                                                                                                                                                                                                                                                                              | .21                  | 0                  | 6-27-56                                   | Rain gauge           | B-36-R           | 6-27-56          |                 |                  |                                                                    |             |             |           |           |               |        |      |
| 6-6                                                                                                                                                                                                                                                                                                                                                                                                                                  | .22                  | 0                  | 10:10a                                    | 0                    | 0                | 10:12a           | 0               | 0                |                                                                    |             |             |           |           |               |        |      |
| 6-7                                                                                                                                                                                                                                                                                                                                                                                                                                  | .76                  | 0                  | :14                                       | 1.35                 | .39              | :15              | .0183           | T                |                                                                    |             |             |           |           |               |        |      |
| 6-19                                                                                                                                                                                                                                                                                                                                                                                                                                 | .04                  | 0                  | :18                                       | 3.45                 | .32              | :17              | .136            | T                |                                                                    |             |             |           |           |               |        |      |
| 6-21                                                                                                                                                                                                                                                                                                                                                                                                                                 | .11                  | 0                  | :22                                       | 2.10                 | .46              | :18              | .257            | .01              |                                                                    |             |             |           |           |               |        |      |
| 6-22                                                                                                                                                                                                                                                                                                                                                                                                                                 | .09                  | 0                  | :26                                       | 1.50                 | .56              | :20              | 1.39            | .04              |                                                                    |             |             |           |           |               |        |      |
| 6-23                                                                                                                                                                                                                                                                                                                                                                                                                                 | .14                  | 0                  | 11:05                                     | .06                  | .60              | :21              | 1.46            | .06              |                                                                    |             |             |           |           |               |        |      |
| 6-25, 26                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.56                 | .45                |                                           |                      |                  | :22              | 1.48            | .09              |                                                                    |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :23             | 1.44             | .11                                                                |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :25             | 1.27             | .16                                                                |             |             |           |           |               |        |      |
| Watershed Conditions: Corn - 2' high in fair condition.                                                                                                                                                                                                                                                                                                                                                                              |                      |                    |                                           |                      |                  |                  | :28             | .873             | .21                                                                |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :32             | .455             | .25                                                                |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :37             | .154             | .28                                                                |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :40             | .0827            | .28                                                                |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :50             | .0164            | .29                                                                |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | 11:05 4/        | .0056            | .29                                                                |             |             |           |           |               |        |      |
| Event of June 12-13, 1958 (Area - 4.16 acres)                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  |                  |                 |                  |                                                                    |             |             |           |           |               |        |      |
| 5-14-58                                                                                                                                                                                                                                                                                                                                                                                                                              | .52                  | .01                | 6-12-58                                   | Rain gauge           | B-36-R           | 6-12-58          |                 |                  |                                                                    |             |             |           |           |               |        |      |
| 5-15                                                                                                                                                                                                                                                                                                                                                                                                                                 | .22                  | 0                  | 11:45p                                    | 0                    | 0                | 11:49p           | 0               | 0                |                                                                    |             |             |           |           |               |        |      |
| 5-16                                                                                                                                                                                                                                                                                                                                                                                                                                 | .25                  | .02                | :47                                       | 1.50                 | .05              | :50              | .0145           | T                |                                                                    |             |             |           |           |               |        |      |
| 5-26                                                                                                                                                                                                                                                                                                                                                                                                                                 | .30                  | 0                  | :49                                       | 3.00                 | .15              | :52              | .381            | .01              |                                                                    |             |             |           |           |               |        |      |
| 5-27                                                                                                                                                                                                                                                                                                                                                                                                                                 | .15                  | 0                  | :51                                       | 2.10                 | .22              | :53              | .424            | .01              |                                                                    |             |             |           |           |               |        |      |
| 6-6                                                                                                                                                                                                                                                                                                                                                                                                                                  | .12                  | 0                  | :55                                       | .15                  | .23              | :54              | .381            | .02              |                                                                    |             |             |           |           |               |        |      |
| 6-12 5/                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.72                 | .14                |                                           |                      |                  | :57              | .125            | .03              |                                                                    |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :59             | .0706            | .03                                                                |             |             |           |           |               |        |      |
| Watershed Conditions: Fallow - last field operation May 22 with the 7 ft. sweep to kill weeds. Very little cover.                                                                                                                                                                                                                                                                                                                    |                      |                    |                                           |                      |                  |                  | 6-13-58         |                  |                                                                    |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | 12:02a          | .0401            | .04                                                                |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :07             | .0183            | .04                                                                |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :11             | .0083            | .04                                                                |             |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  | :40             | 0                | .04                                                                |             |             |           |           |               |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 4.195 for event of June 27, 1956; by 4.195 for event of June 12-13, 1958; and by 4.044 for event of July 3, 1959. 1/ Area changed 1-1-59 from 4.16 acres to 4.01 acres. 4/Beginning of new runoff event. 5/ Rainfall and runoff prior to event beginning 11:45p on 6-12-58.                                                                                                    |                      |                    |                                           |                      |                  |                  |                 |                  |                                                                    |             |             |           |           |               |        |      |

| SELECTED RUNOFF EVENTS                                                                 |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed 6-H |                 |                  |
|----------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                  |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 3, 1959 (Area - 4.01 acres)                                              |                      |                    |                  |                      |                  |                                  |                 |                  |
| 6-18-59                                                                                | .05                  | 0                  | 7-3-59           | Raingage             | B-36-R           | 7-3-59                           |                 |                  |
| 6-19                                                                                   | .37                  | 0                  | 8:31p            | 0                    | 0                | 8:31p                            | 0               | 0                |
| 6-20                                                                                   | 1.31                 | .03                | :33              | 3.00                 | .10              | :32                              | .0086           | T                |
| 6-21                                                                                   | .03                  | 0                  | :37              | 5.70                 | .48              | :33                              | .160            | T                |
| 6-27,28                                                                                | 1.93                 | .39                | :39              | 8.10                 | .75              | :37                              | 2.03            | .07              |
| 6-29                                                                                   | .19                  | T                  | :41              | 7.50                 | 1.00             | :38                              | 2.67            | .11              |
| 6-30                                                                                   | .22                  | 0                  | :43              | 5.10                 | 1.17             | :41                              | 3.16            | .26              |
| Watershed Conditions: Wheat - 3' high<br>ripe and ready to harvest. Good stand.        |                      |                    | :49              | 2.50                 | 1.42             | :42                              | 3.24            | .31              |
|                                                                                        |                      |                    | :52              | 2.00                 | 1.52             | :44                              | 3.14            | .42              |
|                                                                                        |                      |                    | :55              | 3.20                 | 1.68             | :50                              | 2.03            | .68              |
|                                                                                        |                      |                    | 9:01             | 2.00                 | 1.84             | :53                              | 2.00            | .13              |
|                                                                                        |                      |                    | :09              | 3.30                 | 2.32             | :58                              | 1.65            | .93              |
|                                                                                        |                      |                    | :11              | 2.40                 | 2.40             | :59                              | 1.65            | .96              |
|                                                                                        |                      |                    | :14              | 3.60                 | 2.58             | 9:01                             | 1.87            | 1.02             |
|                                                                                        |                      |                    | :16              | 1.50                 | 2.63             | :03                              | 1.81            | 1.08             |
|                                                                                        |                      |                    |                  |                      |                  | :06                              | 2.08            | 1.17             |
|                                                                                        |                      |                    |                  |                      |                  | :07                              | 2.08            | 1.21             |
|                                                                                        |                      |                    |                  |                      |                  | :09                              | 2.02            | 1.28             |
|                                                                                        |                      |                    |                  |                      |                  | :11                              | 2.17            | 1.35             |
|                                                                                        |                      |                    |                  |                      |                  | :12                              | 2.14            | 1.38             |
|                                                                                        |                      |                    |                  |                      |                  | :16                              | 1.42            | 1.50             |
|                                                                                        |                      |                    |                  |                      |                  | :19                              | .957            | 1.56             |
|                                                                                        |                      |                    |                  |                      |                  | :23                              | .532            | 1.61             |
|                                                                                        |                      |                    |                  |                      |                  | :25                              | .395            | 1.62             |
|                                                                                        |                      |                    |                  |                      |                  | :31                              | .153            | 1.65             |
|                                                                                        |                      |                    |                  |                      |                  | :37                              | .0445           | 1.66             |
|                                                                                        |                      |                    |                  |                      |                  | 10:04                            | 0               | 1.66             |
| Notes: To convert runoff in in/hr to cfs, multiply by 4.044 for event of July 3, 1959. |                      |                    |                  |                      |                  |                                  |                 |                  |



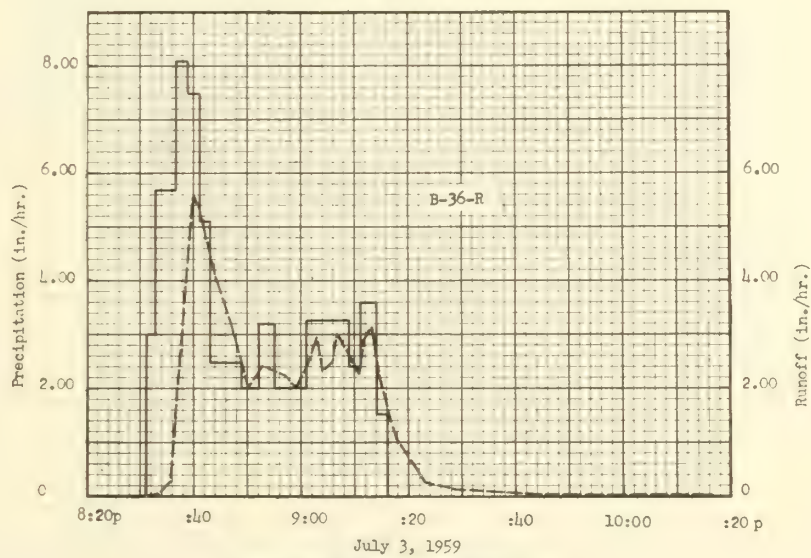
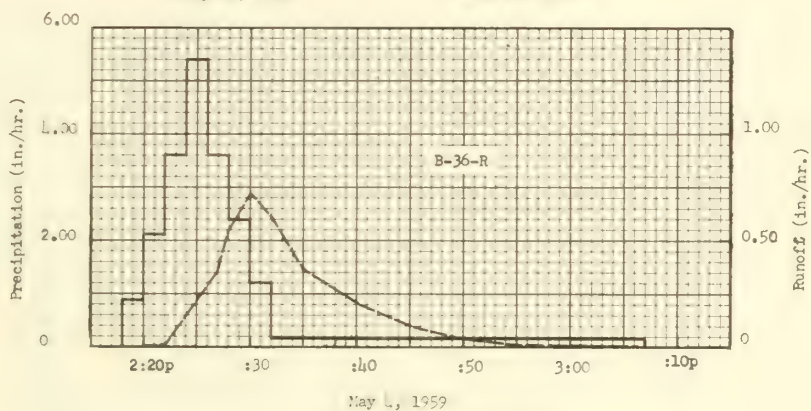
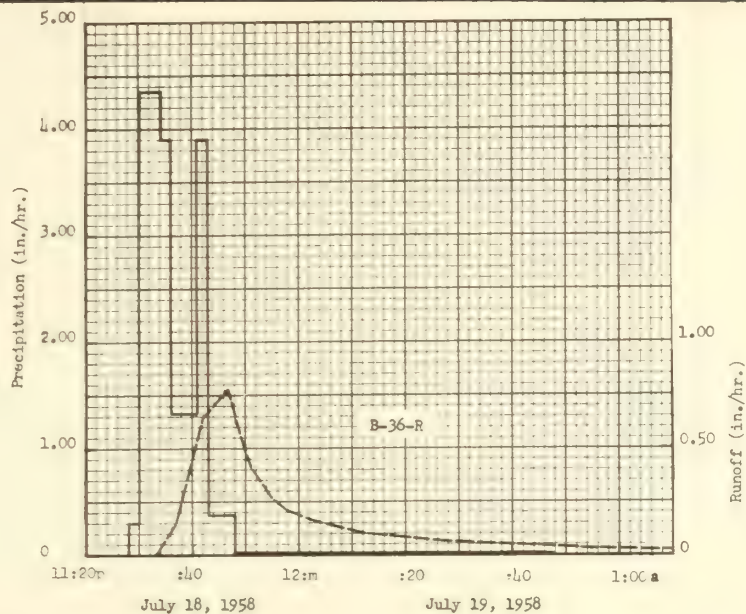
HASTINGS, NEBRASKA WATERSHED 6-H





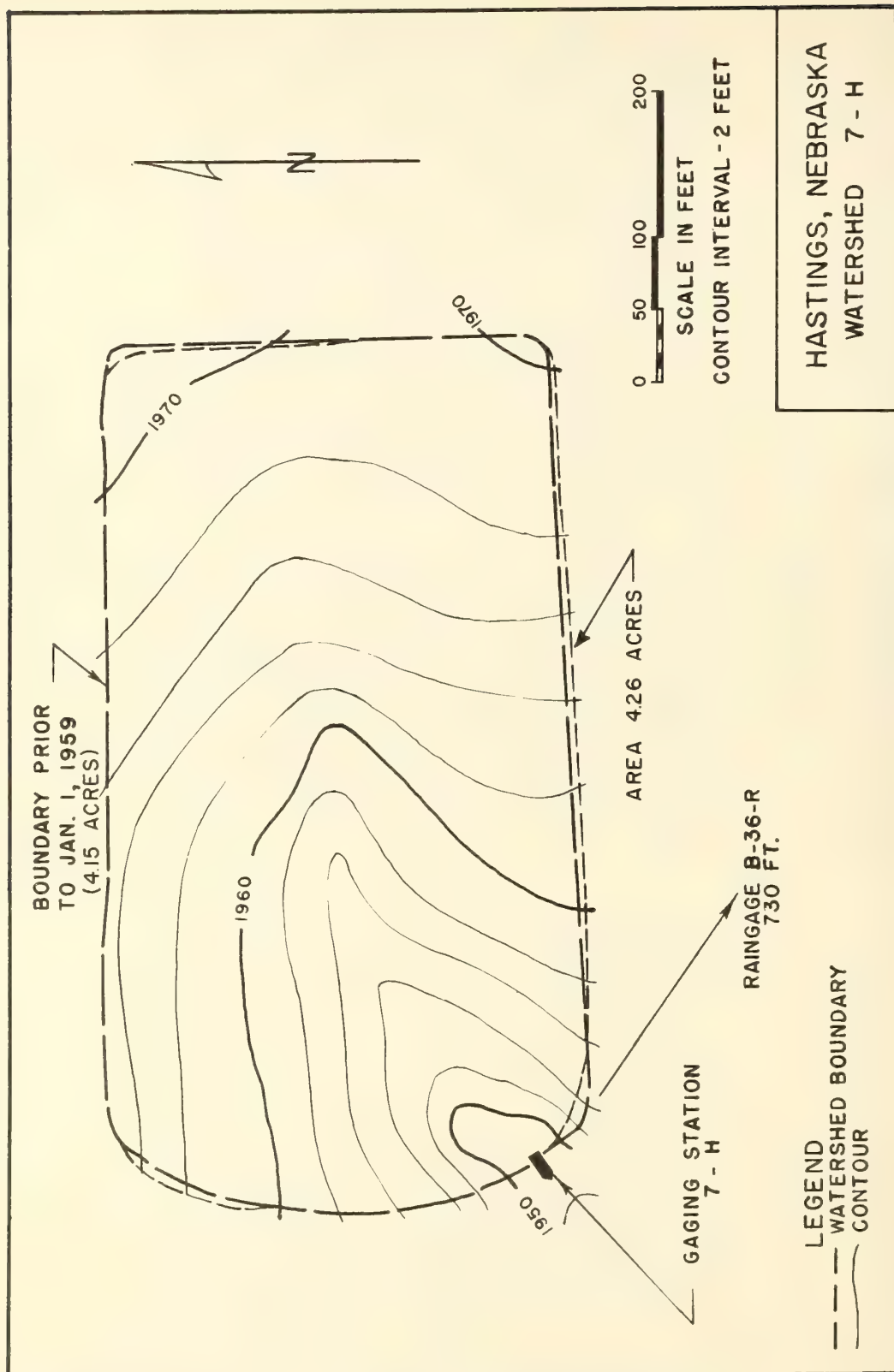
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |               |               |              |               | Hastings, Nebraska Watershed 7-H<br>(Area - 4.15 or 4.26 acres) 1/ |              |             |           |           |               |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|--------------|---------------|--------------------------------------------------------------------|--------------|-------------|-----------|-----------|---------------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   | Jan.            | Feb.                                      | Mar.              | Apr.          | May           | June         | July          | Aug.                                                               | Sept.        | Oct.        | Nov.      | Dec.      | Year          |        |      |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | P<br>Q            | 0.18<br>0       | 0.08<br>T                                 | 0.30<br>0         | 1.10<br>T     | 0.56<br>0     | 4.22<br>.84  | 2.64<br>.04   | 1.59<br>T                                                          | 1.24<br>T    | 0.81<br>.02 | 0.10<br>0 | 0.05<br>0 | 12.91<br>.90  |        |      |
| 1958 2/                                                                                                                                                                                                                                                                                                                                                                                                                                                                | F<br>Q            | .17<br>0        | 1.24<br>.02                               | 1.97<br>0         | 1.73<br>T     | 1.50<br>0     | 2.88<br>.08  | 4.74<br>.49   | 3.51<br>.24                                                        | 1.49<br>.01  | 0.08<br>0   | 0.15<br>0 | .03<br>0  | 19.69<br>.84  |        |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | P<br>Q            | .21<br>0        | .25<br>e .18                              | 3.29<br>.21       | .85<br>.01    | 6.26<br>.90   | 4.89<br>.45  | 3.12<br>2.06  | 3.32<br>.20                                                        | 4.80<br>1.35 | 1.87<br>.28 | T<br>0    | .06<br>0  | 28.95<br>5.64 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               |               |              |               | Hastings, Nebraska Watershed 7-H 2/                                |              |             |           |           |               |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |              |               |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours      |               | 12 hours                                                           |              | 1 day       |           | 2 days    |               | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date         | Vol.          | Date                                                               | Vol.         | Date        | Vol.      | Date      | Vol.          | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 7-18              | .78             | 7-18                                      | .23               | 7-18          | .24           | 7-18         | .29           | 7-18                                                               | .29          | 7-18        | .29       | 7-17      | .33           | 7-17   | .49  |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 7-3               | 2.56            | 7-3                                       | 2.04              | 7-3           | 2.06          | 7-3          | 2.06          | 7-3                                                                | 2.06         | 7-3         | 2.06      | 7-3       | 2.06          | 6-28   | 2.50 |
| Notes: 2/ Flood records discontinued between 1-7-58 and 1-4-59. Quality of records: Monthly P and Q, Annual Maximum Discharges and Volumes - excellent except those that are estimated or partially estimated which are fair. Watershed Conditions: 1958 - oats, straight-row; 1959 - sorghum, subtile; 1960 - fallow, subtile. Crop poor in 1958; very poor in 1959. e - estimated or partially estimated. 3/ Correction: Maximum Discharge, Date, 1-3 should be 6-7. |                   |                 |                                           |                   |               |               |              |               |                                                                    |              |             |           |           |               |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                 |                                           |                   |               |               |              |               | Hastings, Nebraska Watershed 7-H                                   |              |             |           |           |               |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                 | Rainfall                                  |                   |               |               |              |               | Runoff                                                             |              |             |           |           |               |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches) |                                                                    |              |             |           |           |               |        |      |
| July 18 and 19, 1958 (Area - 4.15 acres)                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                 |                                           |                   |               |               |              |               |                                                                    |              |             |           |           |               |        |      |
| 7-18-58                                                                                                                                                                                                                                                                                                                                                                                                                                                                | .21               |                 | 7-18-58                                   | Rain gauge        | B-36-R        | 7-18-58       |              |               |                                                                    |              |             |           |           |               |        |      |
| 6-24-58                                                                                                                                                                                                                                                                                                                                                                                                                                                                | .24               |                 | 11:28p                                    | 0                 | 0             | 11:33p        | 0            | 0             |                                                                    |              |             |           |           |               |        |      |
| 7-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .95               |                 | :30                                       | .30               | .01           | :37           | .144         | T             |                                                                    |              |             |           |           |               |        |      |
| 7-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .38               |                 | :34                                       | 4.35              | .30           | :42           | .741         | .01           |                                                                    |              |             |           |           |               |        |      |
| 7-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .02               |                 | :3                                        | 3.90              | .43           | :47           | .782         | .10           |                                                                    |              |             |           |           |               |        |      |
| 7-12                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .08               | 0               | :41                                       | 1.32              | .51           | :49           | .576         | .12           |                                                                    |              |             |           |           |               |        |      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .31               | 0               | :43                                       | 3.40              | .67           | :51           | .413         | .14           |                                                                    |              |             |           |           |               |        |      |
| 7-16                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .08               | 0               | :-                                        | .34               | .70           | :55           | .245         | .16           |                                                                    |              |             |           |           |               |        |      |
| 7-17                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.07              | .06             | 7-19-58                                   |                   |               | :58           | .206         | .17           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | 12:43a                                    | .02               | .72           | 7-19-58       |              |               |                                                                    |              |             |           |           |               |        |      |
| Watershed Conditions: Sorghum - straight row, 12-13-58. No residue cover. Planted June 27. Last field operation July 10th - weeding.                                                                                                                                                                                                                                                                                                                                   |                   |                 |                                           |                   |               |               |              |               |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | 1:50                                      | 0                 | .72           | 12:03a        | .160         | .19           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | 2:20                                      | .04               | .74           | :12           | .105         | .20           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :27           | .0631        | .23           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :52           | .0373        | .25           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | 2:02          | .0129        | .27           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | 2:22 4/       | .0097        | .28           |                                                                    |              |             |           |           |               |        |      |
| Event of May 4, 1959 (Area - 4.26 acres)                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                 |                                           |                   |               |               |              |               |                                                                    |              |             |           |           |               |        |      |
| 4-10-59                                                                                                                                                                                                                                                                                                                                                                                                                                                                | .01               |                 | 5-4-59                                    | Rain gauge        | B-36-R        | 5-4-59        |              |               |                                                                    |              |             |           |           |               |        |      |
| 4-17                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .31               |                 | 2:12p                                     | 0                 | 0             | 2:24p         | 0            | 0             |                                                                    |              |             |           |           |               |        |      |
| 4-19                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | .51               | .01             | :20                                       | .90               | .03           | :22           | .0178        | T             |                                                                    |              |             |           |           |               |        |      |
| 5-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .25               |                 | :22                                       | 2.10              | .10           | :27           | .372         | .01           |                                                                    |              |             |           |           |               |        |      |
| 5-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .14               |                 | :24                                       | 2.60              | .22           | :27           | .547         | .02           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | :26                                       | 5.40              | .46           | :30           | .720         | .04           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | :28                                       | 3.60              | .52           | :32           | .424         | .06           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | :30                                       | 2.40              | .60           | :35           | .372         | .09           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | :32                                       | 1.20              | .64           | :40           | .214         | .11           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 | 3:07                                      | .19               | .75           | :45           | .102         | .13           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :50           | .0419        | .13           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | :55           | .0142        | .14           |                                                                    |              |             |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                 |                                           |                   |               | 3:06          | 0            | .14           |                                                                    |              |             |           |           |               |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 4.185 for event of July 18-19, 1958; by 4.296 for event of May 4, 1959. 1/ Area changed 1-1-58 from 4.15 acres to 4.26 acres. 4/ Beginning of new storm.                                                                                                                                                                                                                                                         |                   |                 |                                           |                   |               |               |              |               |                                                                    |              |             |           |           |               |        |      |

| SELECTED RUNOFF EVENTS                                                                                         |                      |                    |                  |                      |                  | Hastings, Nebraska Watershed 7-H |                 |                  |
|----------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                          |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                           | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 3, 1959 (Area - 4.26 acres)                                                                      |                      |                    |                  |                      |                  |                                  |                 |                  |
| 6-18-59                                                                                                        | .05                  | 0                  | 7-3-59           | Rain gauge           | B-36-R           | 7-3-59                           |                 |                  |
| 6-19                                                                                                           | .37                  | 0                  | 8:31p            | 0                    | 0                | 8:31p                            | 0               | 0                |
| 6-20                                                                                                           | 1.31                 | .02                | :33              | 3.00                 | .10              | :33                              | .0081           | T                |
| 6-21                                                                                                           | .03                  | 0                  | :37              | 5.70                 | .48              | :35                              | .207            | T                |
| 6-27,28                                                                                                        | 1.93                 | .42                | :39              | 8.10                 | .75              | :37                              | 2.17            | .04              |
| 6-29                                                                                                           | .19                  | 0                  | :41              | 7.50                 | 1.00             | :40                              | 5.56            | .23              |
| 6-30                                                                                                           | .22                  | .01                | :43              | 5.10                 | 1.17             | :41                              | 5.29            | .32              |
|                                                                                                                |                      |                    | :49              | 2.50                 | 1.42             | :44                              | 4.10            | .56              |
|                                                                                                                |                      |                    | :52              | 2.00                 | 1.52             | :47                              | 3.13            | .74              |
|                                                                                                                |                      |                    | :55              | 3.20                 | 1.68             | :50                              | 2.04            | .87              |
| Watershed Conditions: Fallow - last<br>field operation June 27 with treader.<br>Little cover at time of storm. |                      |                    | :57              | 1.80                 | 1.74             | :53                              | 2.42            | .95              |
|                                                                                                                |                      |                    | :59              | 2.40                 | 1.82             | :57                              | 2.22            | 1.13             |
|                                                                                                                |                      |                    | 9:01             | 1.80                 | 1.88             | :59                              | 2.01            | 1.20             |
|                                                                                                                |                      |                    | :04              | 3.60                 | 2.06             | 9:01                             | 2.42            | 1.27             |
|                                                                                                                |                      |                    | :07              | 2.60                 | 2.19             | :03                              | 2.98            | 1.37             |
|                                                                                                                |                      |                    | :09              | 3.90                 | 2.32             | :04                              | 2.31            | 1.41             |
|                                                                                                                |                      |                    | :11              | 2.40                 | 2.40             | :05                              | 2.46            | 1.45             |
|                                                                                                                |                      |                    | :14              | 3.60                 | 2.58             | :07                              | 3.03            | 1.54             |
|                                                                                                                |                      |                    | :16              | 1.50                 | 2.63             | :11                              | 2.31            | 1.72             |
|                                                                                                                |                      |                    |                  |                      |                  | :12                              | 2.93            | 1.76             |
|                                                                                                                |                      |                    |                  |                      |                  | :13                              | 3.12            | 1.81             |
|                                                                                                                |                      |                    |                  |                      |                  | :14                              | 2.31            | 1.86             |
|                                                                                                                |                      |                    |                  |                      |                  | :16                              | 1.51            | 1.92             |
|                                                                                                                |                      |                    |                  |                      |                  | :18                              | 1.07            | 1.96             |
|                                                                                                                |                      |                    |                  |                      |                  | :23                              | .258            | 2.01             |
|                                                                                                                |                      |                    |                  |                      |                  | :29                              | .144            | 2.03             |
|                                                                                                                |                      |                    |                  |                      |                  | :43                              | .0312           | 2.05             |
|                                                                                                                |                      |                    |                  |                      |                  | 10:43                            | 0               | 2.06             |
| Notes: To convert runoff in in/hr to cfs, multiply by 4.296 for event of July 3, 1959.                         |                      |                    |                  |                      |                  |                                  |                 |                  |

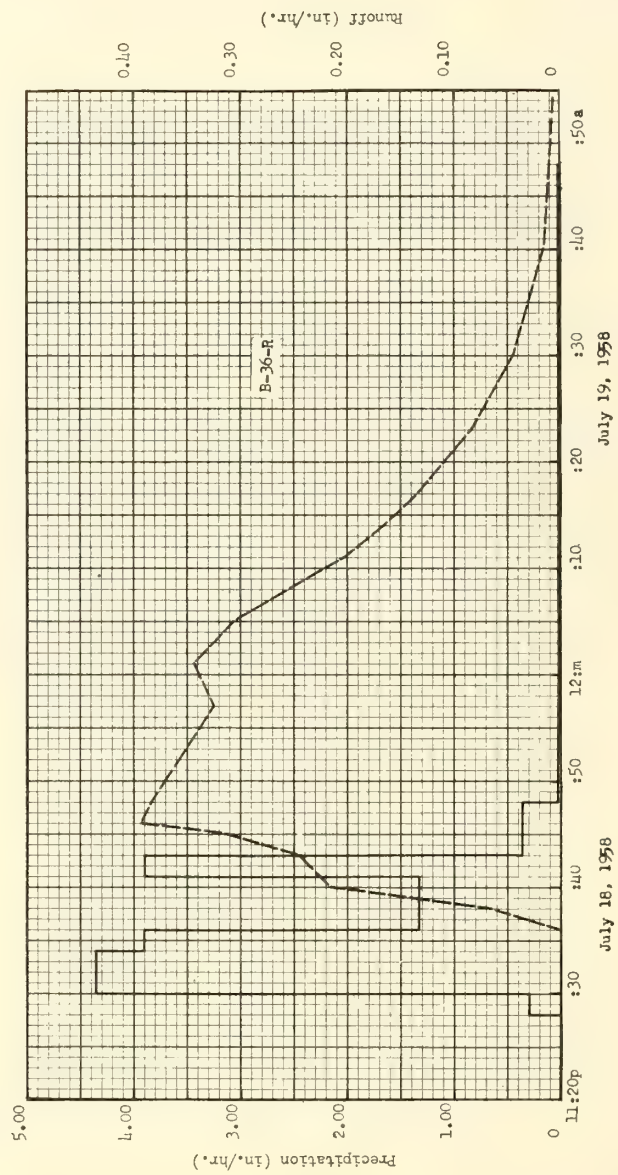


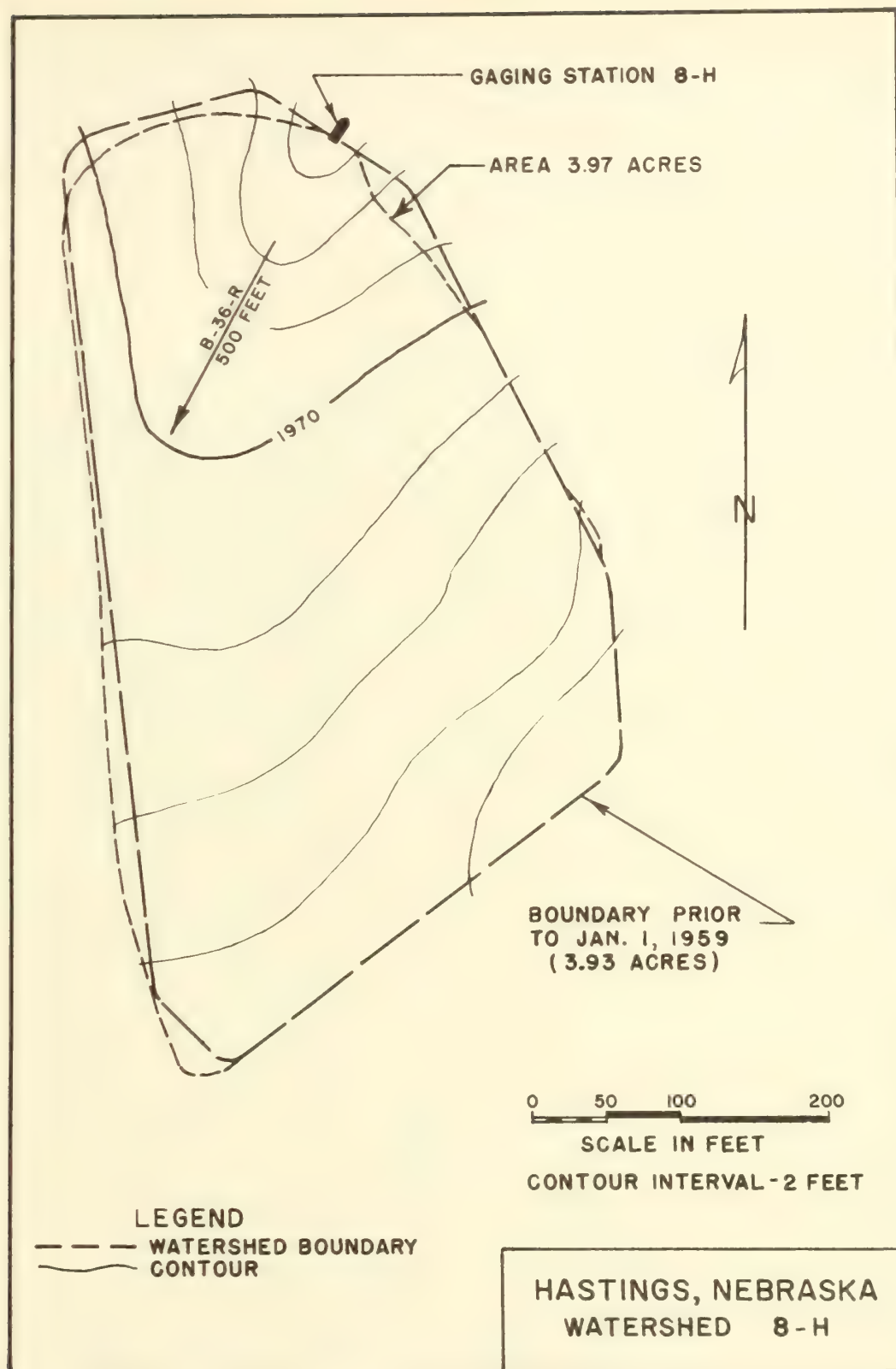
HASTINGS, NEBRASKA WATERSHED 7-H





| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                   |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 8-H<br>(Area - 3.93 or 3.97 acres) 1/ |             |           |           |           |               |      |        |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|--------------------------------------------------------------------|-------------|-----------|-----------|-----------|---------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                               | Jan.                 | Feb.               | Mar.                                      | Apr.                 | May              | June             | July            | Aug.                                                               | Sept.       | Oct.      | Nov.      | Dec.      | Year          |      |        |      |
| 1958 2/<br>P<br>Q                                                                                                                                                                                                                                                           | 0.07<br>0            | 1.24<br>T          | 1.97<br>0                                 | 1.73<br>.07          | 1.50<br>0        | 2.88<br>.01      | 4.74<br>.24     | 3.51<br>.15                                                        | 1.49<br>0   | 1.08<br>0 | 0.45<br>0 | 0.03<br>0 | 19.69<br>.47  |      |        |      |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                              | .21<br>0             | .25<br>T           | 3.29<br>T                                 | .88<br>0             | 6.26<br>.07      | 1.89<br>.78      | 3.12<br>1.69    | 3.32<br>.01                                                        | 4.40<br>.24 | 1.87<br>0 | T<br>0    | .06<br>0  | 28.95<br>2.79 |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                  |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |           |           |           |               |      |        |      |
| Hastings, Nebraska Watershed 8-H                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |           |           |           |               |      |        |      |
| YEAR                                                                                                                                                                                                                                                                        | MAXIMUM<br>DISCHARGE |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                                                                    |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                                                                    | 12 hours    |           | 1 day     |           | 2 days        |      | 8 days |      |
|                                                                                                                                                                                                                                                                             | Date                 | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.                                                               | Date        | Vol.      | Date      | Vol.      | Date          | Vol. | Date   | Vol. |
| 1958                                                                                                                                                                                                                                                                        | 7-18                 | 0.39               | 7-18                                      | .21                  | 7-18             | .21              | 7-18            | .21                                                                | 7-18        | .21       | 7-18      | .21       | 7-17          | .23  | 7-17   | .24  |
| 1959                                                                                                                                                                                                                                                                        | 7-3                  | 3.42               | 7-3                                       | 1.67                 | 7-3              | 1.70             | 7-3             | 1.70                                                               | 7-3         | 1.70      | 7-3       | 1.70      | 7-3           | 1.70 | 6-28   | 2.33 |
| Notes: 2/ Runoff records discontinued between Jan. 4, 1955 and Jan. 8, 1958. Quality of Records: Monthly P and Q, Annual Max. discharges and volumes - excellent. Watershed Conditions: 1958 - wheat, stubbled; 1959 - sorghum stubbles. Good to excellent crop both years. |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |           |           |           |               |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  |                 | Hastings, Nebraska Watershed 8-H                                   |             |           |           |           |               |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                       |                      |                    | Rainfall                                  |                      |                  | Runoff           |                 |                                                                    |             |           |           |           |               |      |        |      |
| Date                                                                                                                                                                                                                                                                        | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches)                                                   |             |           |           |           |               |      |        |      |
| Event of July 18 and 19, 1958 (Area - 3.93 acres)                                                                                                                                                                                                                           |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |           |           |           |               |      |        |      |
| 6-20-58                                                                                                                                                                                                                                                                     | .20                  | 0                  | 7-18-58                                   |                      |                  | 7-18-58          |                 |                                                                    |             |           |           |           |               |      |        |      |
| 6-24-58                                                                                                                                                                                                                                                                     | .20                  | 0                  | 11:28p                                    | 0                    | 0                | 11:30p           | 0               | 0                                                                  |             |           |           |           |               |      |        |      |
| 7-3                                                                                                                                                                                                                                                                         | .95                  | 0                  | :30                                       | .30                  | .01              | :30              | .0666           | .1                                                                 |             |           |           |           |               |      |        |      |
| 7-4                                                                                                                                                                                                                                                                         | .38                  | 0                  | :34                                       | 4.35                 | .30              | :40              | .217            | .01                                                                |             |           |           |           |               |      |        |      |
| 7-10                                                                                                                                                                                                                                                                        | .42                  | 0                  | :36                                       | 3.90                 | .43              | :43              | .243            | .02                                                                |             |           |           |           |               |      |        |      |
| 7-12                                                                                                                                                                                                                                                                        | .31                  | 0                  | :41                                       | 1.32                 | .54              | :45              | .316            | .03                                                                |             |           |           |           |               |      |        |      |
| 7-16                                                                                                                                                                                                                                                                        | .08                  | 0                  | :43                                       | 3.90                 | .67              | :47              | .394            | .03                                                                |             |           |           |           |               |      |        |      |
| 7-17                                                                                                                                                                                                                                                                        | 1.07                 | .02                | :45                                       | .30                  | .70              | :47              | .380            | .05                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    | 7-19-58                                   |                      |                  | :57              | .325            | .10                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    | 12:42a                                    | .02                  | .72              | 7-19-58          |                 |                                                                    |             |           |           |           |               |      |        |      |
| Watershed Conditions: Wheat - combined July 8; about 6000 lbs. straw residue on ground.                                                                                                                                                                                     |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | 12:01a           | .343            | .16                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :05              | .303            | .14                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :11              | .203            | .17                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :14              | .169            | .15                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :17              | .133            | .18                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :23              | .0930           | .20                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :30              | .0454           | .20                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | :40              | .0154           | .21                                                                |             |           |           |           |               |      |        |      |
|                                                                                                                                                                                                                                                                             |                      |                    |                                           |                      |                  | 1:04             | 0               | .21                                                                |             |           |           |           |               |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 3.963 for event of July 18 and 19, 1958. 1/ Area changed 1-1-59 from 3.93 acres to 3.97 acres.                                                                                                                        |                      |                    |                                           |                      |                  |                  |                 |                                                                    |             |           |           |           |               |      |        |      |

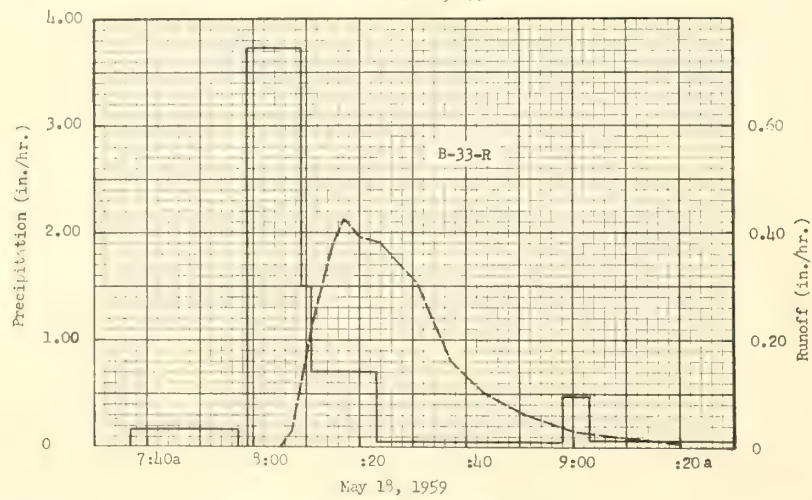
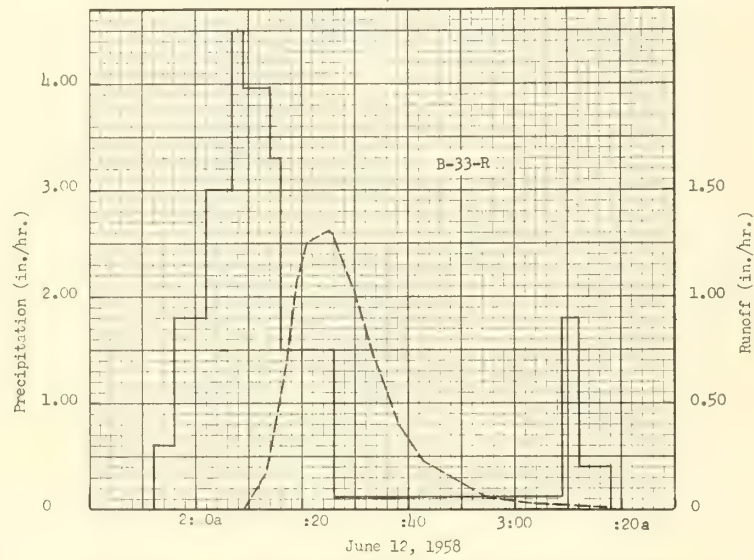
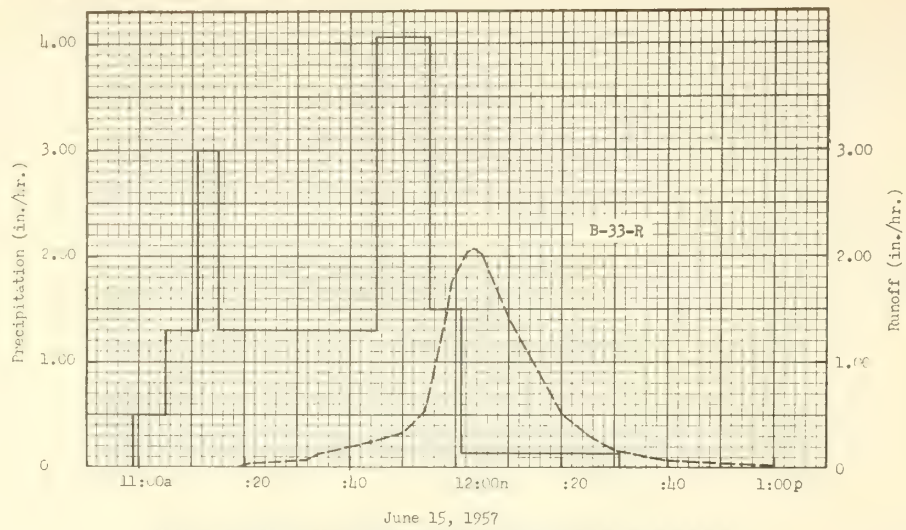




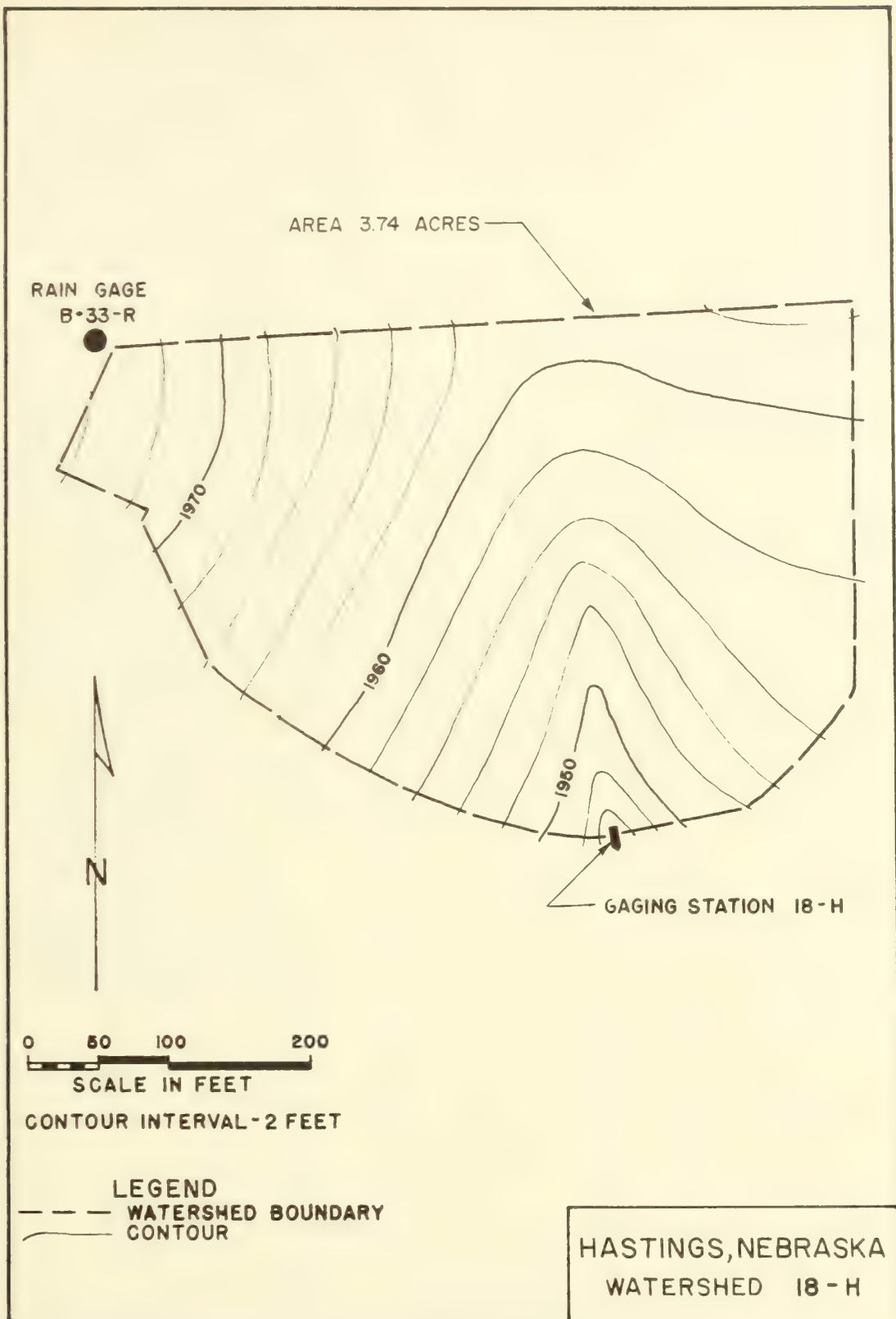


| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                  |                   |                                           |               |                   |               |               |              | Hastings, Nebraska Watershed 18-H<br>(Area - 3.74 acres) |      |        |      |        |      |        |      |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------|---------------|-------------------|---------------|---------------|--------------|----------------------------------------------------------|------|--------|------|--------|------|--------|------|--------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                              |                   | Jan.                                      | Feb.          | Mar.              | Apr.          | May           | June         | July                                                     | Aug. | Sept.  | Oct. | Nov.   | Dec. | Year   |      |        |
| 1957 <sup>1/</sup>                                                                                                                                                                                                                                                                                                                                                                         | P                 | 0.13                                      | 0.06          | 1.67              | 2.82          | 6.38          | 11.12        | 0.09                                                     | 5.44 | 0.59   | 1.22 | 0.64   | 0.11 | 30.27  |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            | Q                 | nr                                        | nr            | 0                 | e .15         | .18           | 3.59         | 0                                                        | .38  | 0      | 0    | 0      | 0    | 4.30   |      |        |
| 1958                                                                                                                                                                                                                                                                                                                                                                                       | P                 | .07                                       | 1.59          | 2.06              | 1.66          | 1.44          | 2.56         | 4.47                                                     | 3.57 | 1.54   | .07  | .42    | .04  | 19.49  |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            | Q                 | 0                                         | .03           | 0                 | T             | 0             | .45          | .13                                                      | .13  | 0      | 0    | 0      | 0    | .74    |      |        |
| 1959                                                                                                                                                                                                                                                                                                                                                                                       | P                 | .19                                       | .28           | 3.44              | .86           | 6.74          | 4.84         | 3.08                                                     | 3.08 | 4.43   | 1.71 | T      | .07  | 28.72  |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            | Q                 | 0                                         | .20           | 0                 | 0             | .64           | e .66        | e 2.05                                                   | .01  | .01    | 0    | 0      | 0    | 3.57   |      |        |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                    |                   |                                           |               |                   |               |               |              | Hastings, Nebraska Watershed 18-H                        |      |        |      |        |      |        |      |        |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                       | MAXIMUM DISCHARGE | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |               |                   |               |               |              |                                                          |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   | 1 hour                                    |               | 2 hours           |               | 6 hours       |              | 12 hours                                                 |      | 1 day  |      | 2 days |      | 8 days |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            | Date              | Rate                                      | Date          | Vol.              | Date          | Vol.          | Date         | Vol.                                                     | Date | Vol.   | Date | Vol.   | Date | Vol.   | Date | Vol.   |
| 1957                                                                                                                                                                                                                                                                                                                                                                                       | 6-15              | 2.07                                      | 6-15          | 0.74              | 6-15          | 1.08          | 6-15         | 2.00                                                     | 6-15 | 2.71   | 6-15 | 2.81   | 6-15 | 3.57   | 6-10 | 3.58   |
| 1958                                                                                                                                                                                                                                                                                                                                                                                       | 6-12              | 1.31                                      | 6-12          | .44               | 6-12          | .45           | 6-12         | .45                                                      | 6-12 | .45    | 6-12 | .45    | 6-12 | .45    | 6-12 | .45    |
| 1959                                                                                                                                                                                                                                                                                                                                                                                       | 7-3               | 2.42                                      | 7-3           | e 2.01            | 7-3           | e 2.05        | 7-3          | e 2.05                                                   | 7-3  | e 2.05 | 7-3  | e 2.05 | 7-3  | e 2.05 | 6-28 | e 2.57 |
| Notes: <sup>1/</sup> Runoff records discontinued 7-1-55; re-established 2-8-57. Quality of Records: Monthly P and Q values, annual maximum discharges and volumes - excellent except those that are estimated or partially estimated which are fair. Watershed Conditions: Native grass pasture - good to excellent conditions, 1957, 1958 and 1959. e - estimated or partially estimated. |                   |                                           |               |                   |               |               |              |                                                          |      |        |      |        |      |        |      |        |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                     |                   |                                           |               |                   |               |               |              | Hastings, Nebraska Watershed 18-H                        |      |        |      |        |      |        |      |        |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                      |                   |                                           | Rainfall      |                   |               | Runoff        |              |                                                          |      |        |      |        |      |        |      |        |
| Date                                                                                                                                                                                                                                                                                                                                                                                       | Rainfall (inches) | Runoff (inches)                           | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches)                                            |      |        |      |        |      |        |      |        |
| Event of June 15, 1957                                                                                                                                                                                                                                                                                                                                                                     |                   |                                           |               |                   |               |               |              |                                                          |      |        |      |        |      |        |      |        |
| 5-15-57                                                                                                                                                                                                                                                                                                                                                                                    | .06               | 0                                         | 6-15-57       | Rainage           | B-33-R        | 6-15-57       |              |                                                          |      |        |      |        |      |        |      |        |
| 5-29                                                                                                                                                                                                                                                                                                                                                                                       | .64               | .02                                       | 10:59a        | 0                 | 0             | 11:19a        | 0            | 0                                                        |      |        |      |        |      |        |      |        |
| 5-31                                                                                                                                                                                                                                                                                                                                                                                       | .31               | 0                                         | 11:05         | .50               | .05           | :21           | .0446        | T                                                        |      |        |      |        |      |        |      |        |
| 6-6                                                                                                                                                                                                                                                                                                                                                                                        | .11               | 0                                         | :11           | 1.30              | .18           | :32           | .0330        | .01                                                      |      |        |      |        |      |        |      |        |
| 6-10                                                                                                                                                                                                                                                                                                                                                                                       | .74               | .01                                       | :15           | 3.00              | .38           | :34           | .128         | .02                                                      |      |        |      |        |      |        |      |        |
| 6-13                                                                                                                                                                                                                                                                                                                                                                                       | 1.00              | T                                         | :45           | 1.30              | 1.03          | :44           | .237         | .05                                                      |      |        |      |        |      |        |      |        |
| Watershed Conditions: Native grass pasture - 12" high, heading and in excellent condition.                                                                                                                                                                                                                                                                                                 |                   |                                           | :55           | 4.03              | 1.71          | :50           | .305         | .07                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           | 12:01 p       | 1.50              | 1.86          | :54           | .546         | .10                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           | :31           | .14               | 1.93          | :58           | 1.42         | .16                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | :59           | 1.75         | .19                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | 12:02p        | 2.02         | .28                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | :03           | 2.07         | .32                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | :05           | 2.02         | .39                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | :10           | 1.42         | .53                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | :20           | .520         | .69                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | :25           | .305         | .72                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | :30           | .171         | .74                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | :40           | .0700        | .76                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | 1:00          | .0125        | .78                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           |               |                   |               | :40           | 0            | .78                                                      |      |        |      |        |      |        |      |        |
| Event of June 12, 1958                                                                                                                                                                                                                                                                                                                                                                     |                   |                                           |               |                   |               |               |              |                                                          |      |        |      |        |      |        |      |        |
| 5-14-58                                                                                                                                                                                                                                                                                                                                                                                    | .50               | T                                         | 6-12-58       | Rainage           | B-33-R        | 6-12-58       |              |                                                          |      |        |      |        |      |        |      |        |
| 5-15                                                                                                                                                                                                                                                                                                                                                                                       | .12               | 0                                         | 1:52a         | 0                 | 0             | 2:09a         | 0            | 0                                                        |      |        |      |        |      |        |      |        |
| 5-16                                                                                                                                                                                                                                                                                                                                                                                       | .30               | 0                                         | :56           | .60               | .04           | :13           | .170         | T                                                        |      |        |      |        |      |        |      |        |
| 5-26                                                                                                                                                                                                                                                                                                                                                                                       | .30               | 0                                         | 2:02          | 1.80              | .22           | :17           | .684         | .03                                                      |      |        |      |        |      |        |      |        |
| 5-27                                                                                                                                                                                                                                                                                                                                                                                       | .16               | 0                                         | :07           | 3.00              | .47           | :19           | 1.07         | .06                                                      |      |        |      |        |      |        |      |        |
| 6-6                                                                                                                                                                                                                                                                                                                                                                                        | .11               | 0                                         | :09           | 4.50              | .62           | :21           | 1.25         | .11                                                      |      |        |      |        |      |        |      |        |
| Watershed Conditions: Native grass pasture - 5" high, in good condition.                                                                                                                                                                                                                                                                                                                   |                   |                                           | :14           | 3.96              | .95           | :25           | 1.31         | .19                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           | :16           | 3.30              | 1.06          | :26           | 1.29         | .21                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           | :26           | 1.50              | 1.31          | :30           | 1.03         | .29                                                      |      |        |      |        |      |        |      |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                           | 3:09          | .11               | 1.39          | :34           | .597         | .34                                                      |      |        |      |        |      |        |      |        |
| Notes: To convert runoff in in/hr to cfs, multiply by 3.771.                                                                                                                                                                                                                                                                                                                               |                   |                                           |               |                   |               |               |              |                                                          |      |        |      |        |      |        |      |        |

44.22-2



HASTINGS, NEBR. OKA WATERSHED 18-H



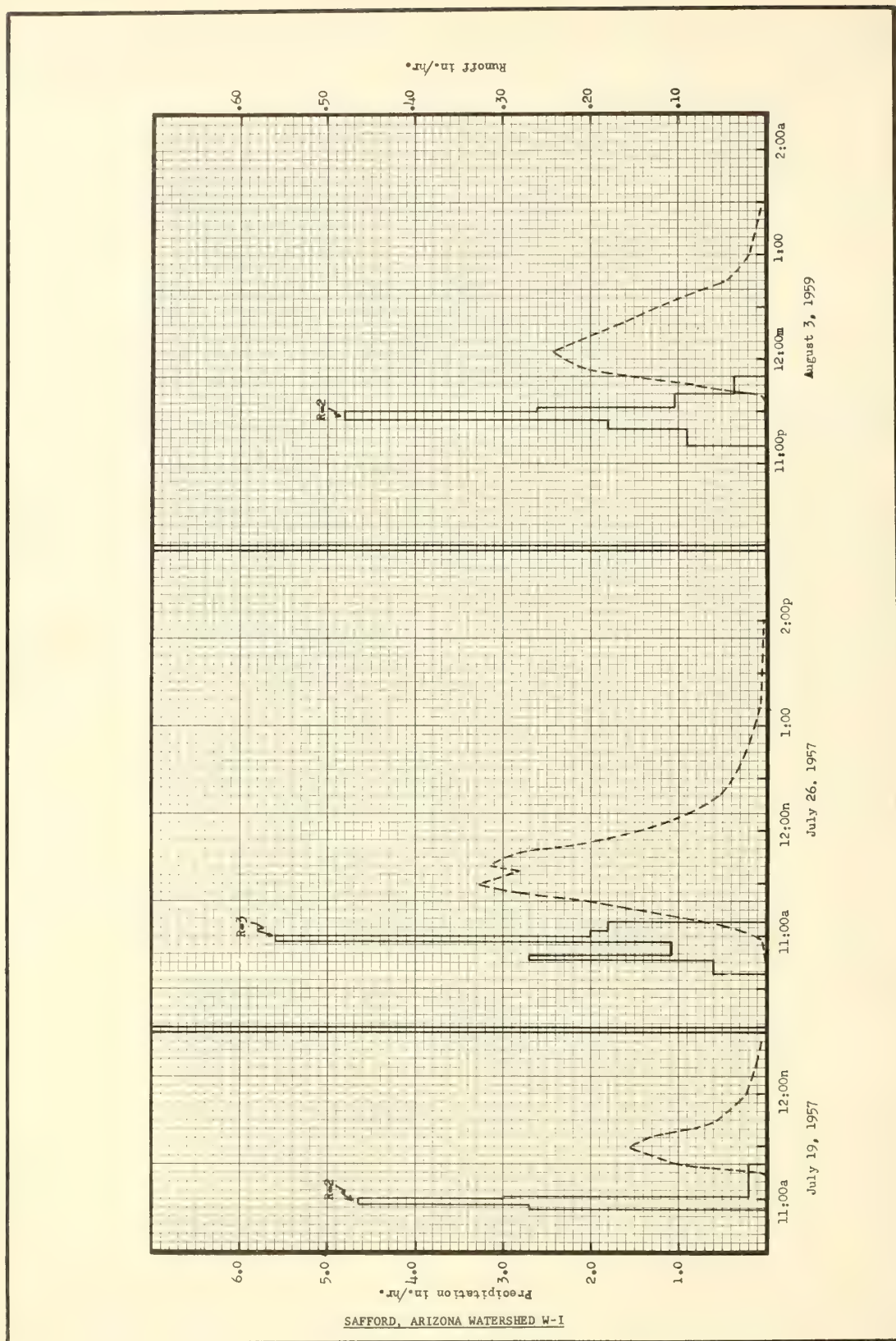


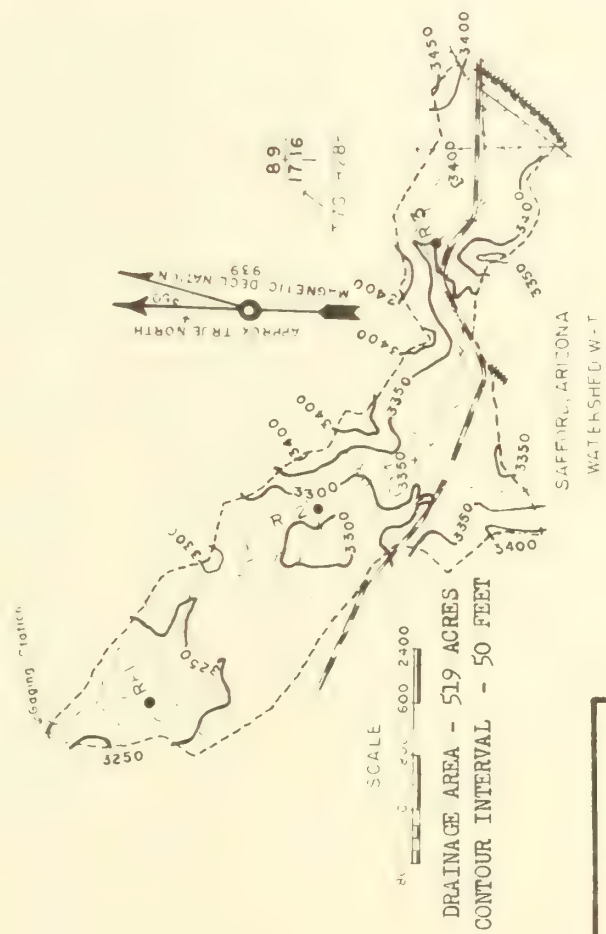
| MONTHLY PRECIPITATION AND RUNOFF (Inches) 1/                                                                                                                                                                                                                                                                                                                               |                      |                    |                                           |                      |                  |                  |                 | Safford, Arizona Watershed W-I<br>Area - 519 acres |           |             |          |           |             |      |        |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|----------------------------------------------------|-----------|-------------|----------|-----------|-------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                              | Jan.                 | Feb.               | Mar.                                      | Apr.                 | May              | June             | July            | Aug.                                               | Sept.     | Oct.        | Nov.     | Dec.      | Year        |      |        |      |
| 1956<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                             | 0.35<br>0            | 0.25<br>0          | 0.04<br>0                                 | 0.14<br>0            | 0.11<br>0        | 0<br>0           | 0.84<br>.02     | 0.54<br>.01                                        | 0<br>0    | 0.09<br>0   | 0<br>0   | 0.31<br>0 | 2.67<br>.03 |      |        |      |
| 1957<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                             | .90<br>0             | .22<br>0           | .43<br>0                                  | .33<br>0             | .06<br>0         | .08<br>0         | 2.08<br>.35     | 1.80<br>.15                                        | .06<br>0  | 1.36<br>.01 | .23<br>0 | .20<br>0  | 7.75<br>.51 |      |        |      |
| 1958<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                             | 0<br>0               | 1.39<br>0          | 1.44<br>0                                 | .41<br>0             | 0<br>0           | .04<br>0         | 2.15<br>.04     | .60<br>0                                           | 1.33<br>0 | .44<br>0    | .02<br>0 | .09<br>0  | 7.91<br>.04 |      |        |      |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                             | 0<br>0               | .26<br>0           | 0<br>0                                    | .15<br>0             | 0<br>0           | .08<br>0         | .98<br>0        | 2.24<br>.18                                        | 0<br>0    | 1.40<br>0   | .19<br>0 | .62<br>0  | 5.92<br>.18 |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  |                  |                 | Safford, Arizona Watershed W-I                     |           |             |          |           |             |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                       | MAXIMUM<br>DISCHARGE |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                                                    |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            |                      |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                                                    | 12 hours  |             | 1 day    |           | 2 days      |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                            | Date                 | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.                                               | Date      | Vol.        | Date     | Vol.      | Date        | Vol. | Date   | Vol. |
| 1956                                                                                                                                                                                                                                                                                                                                                                       | 7-28                 | 0.03               | 7-28                                      | 0.01                 | 7-28             | 0.02             | 7-28            | 0.02                                               | 7-28      | 0.02        | 7-28     | 0.02      | 7-28        | 0.02 | 7-28   | 0.02 |
| 1957                                                                                                                                                                                                                                                                                                                                                                       | 7-26                 | .33                | 7-26                                      | .20                  | 7-26             | .26              | 7-26            | .27                                                | 7-26      | .27         | 7-26     | .27       | 7-26        | .27  | 7-19   | .35  |
| 1958                                                                                                                                                                                                                                                                                                                                                                       | 7-5                  | .04                | 7-5                                       | .03                  | 7-5              | .04              | 7-5             | .04                                                | 7-5       | .04         | 7-5      | .04       | 7-5         | .04  | 7-5    | .04  |
| 1959                                                                                                                                                                                                                                                                                                                                                                       | 8-3                  | .24                | 8-3                                       | .15                  | 8-3              | .17              | 8-3             | .18                                                | 8-4       | .18         | 8-4      | .18       | 8-4         | .18  | 8-4    | .18  |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volume, excellent. Watershed conditions: 85% of area is bare. Sparse vegetation is predominantly shrubs (creosotebush, snakeweed, and catclaw), with some short grasses (tobosa, three-awn, and curly mesquite). 1/ All monthly P values weighted by Thiessen method, using 3 raingages. |                      |                    |                                           |                      |                  |                  |                 |                                                    |           |             |          |           |             |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                     |                      |                    |                                           |                      |                  |                  |                 | Safford, Arizona Watershed W-I                     |           |             |          |           |             |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                      |                      |                    | Rainfall                                  |                      |                  |                  |                 |                                                    | Runoff    |             |          |           |             |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                       | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches)                                   |           |             |          |           |             |      |        |      |
| Event of July 19, 1957                                                                                                                                                                                                                                                                                                                                                     |                      |                    |                                           |                      |                  |                  |                 |                                                    |           |             |          |           |             |      |        |      |
| 7-1-57                                                                                                                                                                                                                                                                                                                                                                     | Raingage R-2         | 0                  | 7-19-57                                   | Raingage             | R-2              | 7-19-57          |                 |                                                    |           |             |          |           |             |      |        |      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                       | 0.09                 | 0                  | 10:54a                                    | 0                    | 0                | 11:14a           | 0               | 0                                                  |           |             |          |           |             |      |        |      |
| 7-17                                                                                                                                                                                                                                                                                                                                                                       | .10                  | 0                  | :56                                       | 2.70                 | .09              | :16              | .0083           | .0001                                              |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            | .49                  | 0                  | 11:00                                     | 4.65                 | .40              | :18              | .0646           | .0008                                              |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            |                      |                    | :01                                       | 3.00                 | .45              | :20              | .1003           | .0037                                              |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            |                      |                    | :20                                       | .20                  | .50              | :30              | .1560           | .0265                                              |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  | :35              | .1347           | .0386                                              |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  | :40              | .0882           | .0479                                              |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  | :45              | .0552           | .0539                                              |           |             |          |           |             |      |        |      |
| Watershed Conditions:<br>(See Notes above)                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | 12:00n           | .0225           | .0628                                              |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  | :15              | .0115           | .0671                                              |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  | :30              | .0077           | .0695                                              |           |             |          |           |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                            |                      |                    |                                           |                      |                  | 2:27p            | 0               | .0741                                              |           |             |          |           |             |      |        |      |
| Notes: To convert runoff in in/hr. to cfs, multiply by 523.32                                                                                                                                                                                                                                                                                                              |                      |                    |                                           |                      |                  |                  |                 |                                                    |           |             |          |           |             |      |        |      |

Cooperative Research Project of USDA and Arizona Agricultural Experiment Station

| SELECTED RUNOFF EVENTS                                                                                                                                                                        |                      |                    |                  |                      |                  | Safford, Arizona Watershed W-1 |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|--------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                         |                      |                    | Rainfall         |                      |                  | Runoff                         |                 |                  |
| Date                                                                                                                                                                                          | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time               | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 26, 1957                                                                                                                                                                        |                      |                    |                  |                      |                  |                                |                 |                  |
|                                                                                                                                                                                               | Raingage R-3         |                    | 7-26-57          | Raingage R-3         |                  | 7-26-57                        |                 |                  |
| 7-16-57                                                                                                                                                                                       | 0.54                 | 0                  | 10:30a           | 0                    | 0                | 10:15a                         | 0               | 0                |
| 7-19                                                                                                                                                                                          | .50                  | .07                | :48              | .60                  | .07              | :57                            | .024            | .0001            |
| 7-25                                                                                                                                                                                          | .40                  | 0                  | :13              | 2.70                 | .16              | 11:02                          | .0231           | .0011            |
| 7-26                                                                                                                                                                                          | .22                  | 0                  | :57              | 1.07                 | .32              | :05                            | .0434           | .0023            |
|                                                                                                                                                                                               | Raingage R-2         |                    | 11:00            | 5.60                 | .60              | :08                            | .0772           | .0058            |
| 7-1-57                                                                                                                                                                                        | .09                  | 0                  | :03              | 2.00                 | .70              | :15                            | .1423           | .0190            |
| 7-15                                                                                                                                                                                          | .10                  | 0                  | :08              | 1.80                 | .55              | :20                            | .2025           | .0330            |
| 7-17                                                                                                                                                                                          | .49                  | 0                  |                  |                      |                  | :25                            | .2734           | .0533            |
| 7-19                                                                                                                                                                                          | .50                  | .07                |                  |                      |                  | :29                            | .3266           | .0753            |
| 7-25                                                                                                                                                                                          | .28                  | 0                  |                  |                      |                  | :37                            | .2827           | .1136            |
| 8-1                                                                                                                                                                                           | 0                    | T                  |                  |                      |                  | :40                            | .3132           | .1283            |
| Watershed Conditions: 85% of area is bare. Sparse vegetation is predominantly shrubs (creosotebush, snakeweed, and catclaw), with some short grasses (tobosa, three-awn, and curly mesquite). |                      |                    |                  |                      |                  | :43                            | .2731           | .1672            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | :51                            | .2407           | .1800            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | :55                            | .1883           | .1743            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | 12:00n                         | .1461           | .2082            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | :10p                           | .0896           | .2273            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | :20                            | .0538           | .2373            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | :45                            | .0237           | .2554            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | 1:10                           | .0087           | .2614            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | 2:00                           | .0046           | .2667            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | 12:06a                         | 0               | .2729            |
| Event of August 3, 1957                                                                                                                                                                       |                      |                    |                  |                      |                  |                                |                 |                  |
|                                                                                                                                                                                               | Raingage R-2         |                    | 8-3-59           | Raingage R-2         |                  | 8-3-59                         |                 |                  |
| 7-3-59                                                                                                                                                                                        | .22                  | 0                  | 11:10p           | 0                    | 0                | 11:36p                         | 0               | 0                |
| 7-25                                                                                                                                                                                          | .20                  | 0                  | :20              | .90                  | .15              | :38                            | .0341           | .0001            |
| 7-28                                                                                                                                                                                          | .05                  | 0                  | :25              | 1.80                 | .30              | :40                            | .0152           | .0004            |
| 7-29                                                                                                                                                                                          | .58                  | 0                  | :30              | 4.80                 | .70              | :41                            | .3856           | .0007            |
| 8-1                                                                                                                                                                                           | .35                  | T                  | :33              | 2.60                 | .83              | :42                            | .0395           | .0012            |
|                                                                                                                                                                                               |                      |                    | :48              | 1.03                 | .95              | :45                            | .0772           | .0041            |
|                                                                                                                                                                                               |                      |                    | :50              | .36                  | 1.01             | :50                            | .1461           | .0134            |
|                                                                                                                                                                                               | Raingage R-3         |                    |                  |                      |                  | :55                            | .2082           | .0257            |
| 7-3-59                                                                                                                                                                                        | .39                  | 0                  |                  |                      |                  | 8-4-59                         |                 |                  |
| 7-24                                                                                                                                                                                          | .10                  | 0                  |                  |                      |                  | 12:05a                         | .2426           | .0633            |
| 7-25                                                                                                                                                                                          | .13                  | 0                  |                  |                      |                  | :20                            | .1664           | .1144            |
| 7-28                                                                                                                                                                                          | .40                  | 0                  |                  |                      |                  | :30                            | .1234           | .1386            |
| 8-1                                                                                                                                                                                           | .27                  | T                  |                  |                      |                  | :45                            | .0493           | .1602            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | 1:00                           | .0195           | .1786            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | :27                            | .0044           | .1742            |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  | 10:04a                         | 0               | .1764            |
| Watershed Conditions: 85% of area is bare. Sparse vegetation is predominantly shrubs (creosotebush, snakeweed, and catclaw), with some short grasses (tobosa, three-awn, and curly mesquite). |                      |                    |                  |                      |                  |                                |                 |                  |
|                                                                                                                                                                                               |                      |                    |                  |                      |                  |                                |                 |                  |

Notes: To convert runoff in in/hr. to cfs, multiply by 523.32.  
 1/ Rainfall occurred at 2:30 a.m. and is separate from event reported.





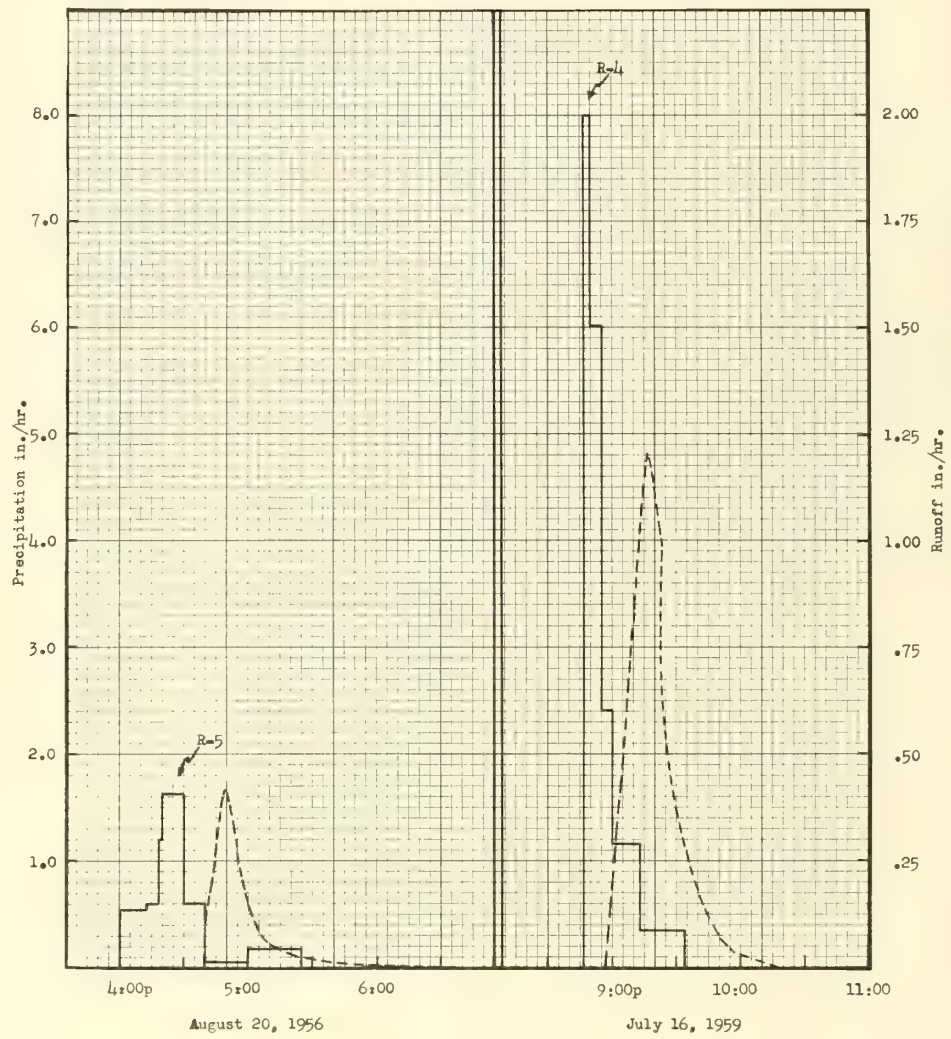
SAFFORD, ARIZONA  
WATERSHED W-I



| MONTHLY PRECIPITATION AND RUNOFF (Inches) 1/                                                                                                                                                                                                                                                                                                                                                                     |                      |           |                                           |                  |                      |                      |                  | Safford, Arizona Watershed W-II<br>Area - 682 acres |                 |             |                  |           |              |      |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------|-------------------------------------------|------------------|----------------------|----------------------|------------------|-----------------------------------------------------|-----------------|-------------|------------------|-----------|--------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                                    | Jan.                 | Feb.      | Mar.                                      | Apr.             | May                  | June                 | July             | Aug.                                                | Sept.           | Oct.        | Nov.             | Dec.      | Year         |      |        |      |
| 1956                                                                                                                                                                                                                                                                                                                                                                                                             | P 1.08<br>Q 0        | 0.48<br>0 | 0<br>0                                    | 0.29<br>0        | 0.33<br>0            | 0.01<br>0            | 1.22<br>0        | 2.06<br>.17                                         | 0<br>0          | 0.38<br>0   | 0<br>0           | 0.32<br>0 | 6.17<br>.17  |      |        |      |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                             | P 1.28<br>Q 0        | .30<br>0  | .34<br>0                                  | .27<br>0         | .48<br>0             | .18<br>0             | 2.43<br>0        | 2.86<br>.01                                         | 0<br>0          | 2.38<br>.03 | .68<br>0         | .82<br>0  | 12.02<br>.04 |      |        |      |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                             | P 0<br>Q 0           | 1.75<br>0 | 2.05<br>0                                 | .63<br>0         | 0<br>0               | .67<br>0             | 1.71<br>0        | 2.12<br>0                                           | 1.07<br>0       | .48<br>0    | .40<br>0         | 0<br>0    | 10.88<br>0   |      |        |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                             | P 0<br>Q 0           | .55<br>0  | 0<br>0                                    | .02<br>0         | 0<br>0               | .03<br>0             | 3.32<br>.45      | 2.02<br>.02                                         | 0<br>0          | 1.95<br>0   | .39<br>0         | 1.24<br>0 | 9.52<br>.47  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                       |                      |           |                                           |                  |                      |                      |                  | Safford, Arizona Watershed W-II                     |                 |             |                  |           |              |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                             | MAXIMUM<br>DISCHARGE |           | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                  |                      |                      |                  |                                                     |                 |             |                  |           |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |           | 1 hour                                    |                  | 2 hours              |                      | 6 hours          |                                                     | 12 hours        |             | 1 day            |           | 2 days       |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                  | Date                 | Rate      | Date                                      | Vol.             | Date                 | Vol.                 | Date             | Vol.                                                | Date            | Vol.        | Date             | Vol.      | Date         | Vol. | Date   | Vol. |
| 1956                                                                                                                                                                                                                                                                                                                                                                                                             | 8-20                 | 0.41      | 8-20                                      | 0.12             | 8-20                 | 0.13                 | 8-20             | 0.13                                                | 8-20            | 0.13        | 8-20             | 0.13      | 8-20         | 0.13 | 8-16   | 0.17 |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                             | 8-30                 | .06       | 10-12                                     | .02              | 10-12                | .03                  | 10-12            | .03                                                 | 10-12           | .03         | 10-12            | .03       | 10-12        | .03  | 10-12  | .03  |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                             | 0                    |           | 0                                         |                  | 0                    |                      | 0                |                                                     | 0               |             | 0                |           | 0            |      | 0      |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                             | 7-16                 | 1.20      | 7-16                                      | .41              | 7-16                 | .41                  | 7-16             | .41                                                 | 7-16            | .41         | 7-16             | .41       | 7-16         | .41  | 7-16   | .41  |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max discharges and volume, excellent. Watershed conditions: Sparsely vegetated rangeland. About 75% of area is bare. Vegetative cover is about equally divided between short grasses (black, hairy and side-oats grama) and shrubs (creosotebush, beargrass and mesquite). 1/ All monthly P values weighted by Thiessen method, using 3 raingages. |                      |           |                                           |                  |                      |                      |                  |                                                     |                 |             |                  |           |              |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                           |                      |           |                                           |                  |                      |                      |                  | Safford, Arizona Watershed W-II                     |                 |             |                  |           |              |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                            |                      |           |                                           | Rainfall         |                      |                      |                  | Runoff                                              |                 |             |                  |           |              |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                             | Rainfall<br>(inches) |           | Runoff<br>(inches)                        |                  | Date and<br>time     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                                    | Rate<br>(in/hr) |             | Acc.<br>(inches) |           |              |      |        |      |
| Event of August 20, 1956                                                                                                                                                                                                                                                                                                                                                                                         |                      |           |                                           |                  |                      |                      |                  |                                                     |                 |             |                  |           |              |      |        |      |
| 7-20-56                                                                                                                                                                                                                                                                                                                                                                                                          | Raingage R-5<br>0.10 |           | 0                                         | 8-20-56<br>4:00p | Raingage R-5 1/<br>0 |                      | 0                | 8-20-56<br>4:39p                                    | 0               |             | 0                |           |              |      |        |      |
| 7-23                                                                                                                                                                                                                                                                                                                                                                                                             | .36                  |           | 0                                         | :13              | .55                  |                      | .12              | :40                                                 | .1115           |             | .0017            |           |              |      |        |      |
| 7-26                                                                                                                                                                                                                                                                                                                                                                                                             | .37                  |           | 0                                         | :18              | .60                  |                      | .17              | :43                                                 | .1986           |             | .0092            |           |              |      |        |      |
| 7-29                                                                                                                                                                                                                                                                                                                                                                                                             | .10                  |           | 0                                         | :20              | 1.20                 |                      | .25              | :46                                                 | .3175           |             | .0216            |           |              |      |        |      |
| 8-11                                                                                                                                                                                                                                                                                                                                                                                                             | .36                  |           | 0                                         | :30              | 1.62                 |                      | .52              | :49                                                 | .4118           |             | .0395            |           |              |      |        |      |
| 8-12                                                                                                                                                                                                                                                                                                                                                                                                             | .05                  |           | 0                                         | :40              | .60                  |                      | .62              | :54                                                 | .3117           |             | .0707            |           |              |      |        |      |
| 8-13                                                                                                                                                                                                                                                                                                                                                                                                             | .41                  |           | 0                                         | 5:00             | .04                  |                      | .63              | :56                                                 | .2436           |             | .0799            |           |              |      |        |      |
| 8-15                                                                                                                                                                                                                                                                                                                                                                                                             | .12                  |           | 0                                         | :25              | .19                  |                      | .71              | :59                                                 | .1769           |             | .0901            |           |              |      |        |      |
| 8-16                                                                                                                                                                                                                                                                                                                                                                                                             | .48                  |           | .04                                       |                  |                      |                      |                  | 5:01                                                | .1302           |             | .0951            |           |              |      |        |      |
| Watershed Conditions:<br>(see notes above)                                                                                                                                                                                                                                                                                                                                                                       |                      |           |                                           |                  |                      |                      |                  |                                                     |                 |             |                  |           |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |           |                                           |                  |                      |                      |                  | 5:05                                                | .0838           |             | .1020            |           |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |           |                                           |                  |                      |                      |                  | :10                                                 | .0569           |             | .1076            |           |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |           |                                           |                  |                      |                      |                  | :20                                                 | .0333           |             | .1150            |           |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |           |                                           |                  |                      |                      |                  | :30                                                 | .0195           |             | .1192            |           |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |           |                                           |                  |                      |                      |                  | :55                                                 | .0084           |             | .1237            |           |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |           |                                           |                  |                      |                      |                  | 6:04                                                | .0052           |             | .1247            |           |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |           |                                           |                  |                      |                      |                  | :30                                                 | 0               |             | .1260            |           |              |      |        |      |
| Notes: To convert runoff in in/hr. to cfs, multiply by 687.68.<br>1/ R-7 Weekly Gage had 0.90 rainfall for August 20, 1956.<br>For watershed map see Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS-SWC, January 1960.                                                                                                                                                       |                      |           |                                           |                  |                      |                      |                  |                                                     |                 |             |                  |           |              |      |        |      |

Cooperative Research Project of USDA and Arizona Agricultural Experiment Station

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                               |                      |                    |                  |                      |                  | Safford, Arizona Watershed W-II |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|---------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                |                      |                    | Rainfall         |                      |                  | Runoff                          |                 |                  |
| Date                                                                                                                                                                                                                                 | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 16, 1959                                                                                                                                                                                                               |                      |                    |                  |                      |                  |                                 |                 |                  |
|                                                                                                                                                                                                                                      | Raingage R-4         |                    | 7-16-59          | Raingage R-4         |                  | 7-16-59                         |                 |                  |
| 7-1-59                                                                                                                                                                                                                               | 0.45                 | 0                  | 8:47p            | 0                    | 0                | 8:57p                           | 0               | 0                |
| 7-12                                                                                                                                                                                                                                 | .10                  | 0                  | :50              | 8.00                 | 0.40             | 9:01                            | .2160           | .0113            |
| 7-15                                                                                                                                                                                                                                 | .13                  | 0                  | :55              | 6.00                 | .90              | :02                             | .2798           | .0160            |
|                                                                                                                                                                                                                                      |                      |                    | 9:00             | 2.40                 | 1.10             | :04                             | .3915           | .0277            |
|                                                                                                                                                                                                                                      | Raingage R-5         |                    | :13              | 1.15                 | 1.35             | :05                             | .4596           | .0353            |
| 7-1-59                                                                                                                                                                                                                               | .30                  | 0                  | :34              | .34                  | 1.47             | :06                             | .5191           | .0438            |
| 7-12                                                                                                                                                                                                                                 | .10                  | 0                  |                  |                      |                  | :08                             | .6873           | .0611            |
| 7-15                                                                                                                                                                                                                                 | .13                  | 0                  |                  |                      |                  | :10                             | .7830           | .0817            |
|                                                                                                                                                                                                                                      |                      |                    |                  |                      |                  | :17                             | 1.2035          | .1990            |
|                                                                                                                                                                                                                                      | Raingage R-7         |                    |                  |                      |                  | :24                             | .9976           | .3076            |
| 7-1-59                                                                                                                                                                                                                               | .10                  | 0                  |                  |                      |                  | :26                             | .5191           | .3373            |
| 7-12                                                                                                                                                                                                                                 | .13                  | 0                  |                  |                      |                  | :31                             | .3538           | .3658            |
| 7-15                                                                                                                                                                                                                                 | .05                  | 0                  |                  |                      |                  | :40                             | .1769           | .3918            |
|                                                                                                                                                                                                                                      |                      |                    |                  |                      |                  | :45                             | .1115           | .4011            |
|                                                                                                                                                                                                                                      |                      |                    |                  |                      |                  | :50                             | .0683           | .4068            |
|                                                                                                                                                                                                                                      |                      |                    |                  |                      |                  | :56                             | .0392           | .4121            |
|                                                                                                                                                                                                                                      |                      |                    |                  |                      |                  | 10:17                           | 0               | .4126            |
| Watershed Conditions: Sparsely vegetated rangeland. About 75% of area is bare. Vegetative cover is about equally divided between short grasses (black, hairy and side-oats grama) and shrubs (creosotebush, beargrass and mesquite). |                      |                    |                  |                      |                  |                                 |                 |                  |
| Notes: To convert runoff in in/hr. to cfs multiply by 687.68.                                                                                                                                                                        |                      |                    |                  |                      |                  |                                 |                 |                  |



SAFFORD, ARIZONA WATERSHED W-II

| MONTHLY PRECIPITATION AND RUNOFF (Inches) 1/                                                                                                                                                                                                                                                                                                                   |                       |                    |                                           |                      |                  |                  |                 | Safford, Arizona Watershed W-IV<br>Area- Area - 754 acres |          |       |       |      |        |       |        |      |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|-----------------------------------------------------------|----------|-------|-------|------|--------|-------|--------|------|--|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                  |                       | Jan.               | Feb.                                      | Mar.                 | Apr.             | May              | June            | July                                                      | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |  |
| 1956                                                                                                                                                                                                                                                                                                                                                           | P                     | 0.21               | 0.16                                      | 0.16                 | 0.16             | 0.06             | 0.07            | 1.63                                                      | 0.17     | 0.12  | 0.26  | 0    | 0.36   | 3.20  |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                | Q                     | 0                  | 0                                         | 0                    | 0                | 0                | 0               | .03                                                       | 0        | 0     | 0     | 0    | 0      | .03   |        |      |  |
| 1957                                                                                                                                                                                                                                                                                                                                                           | P                     | 1.38               | .33                                       | .68                  | .12              | .08              | .10             | 2.52                                                      | 1.74     | .10   | 1.02  | .40  | .24    | 8.71  |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                | Q                     | 0                  | 0                                         | 0                    | 0                | 0                | 0               | .03                                                       | .05      | 0     | 0     | 0    | 0      | .08   |        |      |  |
| 1958                                                                                                                                                                                                                                                                                                                                                           | P                     | .09                | 1.16                                      | 1.44                 | .75              | .11              | 1.47            | 2.85                                                      | 2.20     | 2.48  | .45   | .20  | 0      | 13.20 |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                | Q                     | 0                  | 0                                         | 0                    | 0                | 0                | T               | .19                                                       | .37      | 0     | 0     | 0    | 0      | .56   |        |      |  |
| 1959                                                                                                                                                                                                                                                                                                                                                           | P                     | .03                | .26                                       | 0                    | 0                | 0                | 0               | 1.05                                                      | 2.68     | 0     | 1.56  | .07  | .80    | 6.45  |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                | Q                     | 0                  | 0                                         | 0                    | 0                | 0                | 0               | 0                                                         | .04      | 0     | 0     | 0    | 0      | .04   |        |      |  |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                     |                       |                    |                                           |                      |                  |                  |                 | Safford, Arizona Watershed W-IV                           |          |       |       |      |        |       |        |      |  |
| YEAR                                                                                                                                                                                                                                                                                                                                                           | MAXIMUM<br>DISCHARGE  |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                                                           |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                                                           | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |  |
|                                                                                                                                                                                                                                                                                                                                                                | Date                  | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.                                                      | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |  |
| 1956                                                                                                                                                                                                                                                                                                                                                           | 7-1                   | 0.04               | 7-27                                      | 0.02                 | 7-27             | 0.02             | 7-27            | 0.02                                                      | 7-27     | 0.02  | 7-27  | 0.02 | 7-27   | 0.02  | 7-27   | 0.02 |  |
| 1957                                                                                                                                                                                                                                                                                                                                                           | 8-22                  | .05                | 8-22                                      | .03                  | 8-22             | .04              | 8-22            | .05                                                       | 8-22     | .05   | 8-22  | .05  | 8-22   | .05   | 8-22   | .05  |  |
| 1958                                                                                                                                                                                                                                                                                                                                                           | 8-16                  | .66                | 8-16                                      | .33                  | 8-16             | .37              | 8-16            | .37                                                       | 8-16     | .37   | 8-16  | .37  | 8-16   | .37   | 8-16   | .37  |  |
| 1959                                                                                                                                                                                                                                                                                                                                                           | 8-2                   | .03                | 8-2                                       | .02                  | 8-2              | .02              | 8-2             | .02                                                       | 8-2      | .02   | 8-2   | .02  | 8-2    | .02   | 8-2    | .02  |  |
| Notes: Quality of Records: Monthly P and Q, excellent; Annual Maximum Discharges and Volumes, excellent. Watershed Conditions: 80% of area is bare. Sparse vegetation is composed entirely of shrubs (creosotebush, snakeweed, cactus, and mesquite) except for trace of short grasses. 1/ All monthly P values weighted by Thiessen method using 3 raingages. |                       |                    |                                           |                      |                  |                  |                 |                                                           |          |       |       |      |        |       |        |      |  |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                         |                       |                    |                                           |                      |                  |                  |                 | Safford, Arizona Watershed W-IV                           |          |       |       |      |        |       |        |      |  |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                          |                       |                    | Rainfall                                  |                      |                  |                  |                 | Runoff                                                    |          |       |       |      |        |       |        |      |  |
| Date                                                                                                                                                                                                                                                                                                                                                           | Rainfall<br>(inches)  | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches)                                          |          |       |       |      |        |       |        |      |  |
| Event of July 28, 1958                                                                                                                                                                                                                                                                                                                                         |                       |                    |                                           |                      |                  |                  |                 |                                                           |          |       |       |      |        |       |        |      |  |
| 6-30-58                                                                                                                                                                                                                                                                                                                                                        | Raingage R-11<br>0.72 | T                  | 7-28-58<br>6:07p                          | Raingage<br>0        | R-11<br>0        | 7-28-58<br>6:35p | 0               | 0                                                         |          |       |       |      |        |       |        |      |  |
| 7-5                                                                                                                                                                                                                                                                                                                                                            | .24                   | 0                  | :10                                       | 2.00                 | .10              | :37              | .0116           | .0002                                                     |          |       |       |      |        |       |        |      |  |
| 7-14                                                                                                                                                                                                                                                                                                                                                           | .36                   | .02                | :20                                       | 1.20                 | .30              | :42              | .0221           | .0018                                                     |          |       |       |      |        |       |        |      |  |
| 7-18                                                                                                                                                                                                                                                                                                                                                           | .46                   | 0                  | :30                                       | 1.98                 | .63              | :53              | .0270           | .0060                                                     |          |       |       |      |        |       |        |      |  |
| 6-30-58                                                                                                                                                                                                                                                                                                                                                        | Raingage R-9<br>.40   | T                  | 7:00                                      | .40                  | .83              | 7:15             | .0112           | .0127                                                     |          |       |       |      |        |       |        |      |  |
| 7-5                                                                                                                                                                                                                                                                                                                                                            | .09                   | 0                  | :10                                       | .36                  | .89              | :25              | .0312           | .0165                                                     |          |       |       |      |        |       |        |      |  |
| 7-14                                                                                                                                                                                                                                                                                                                                                           | .85                   | .02                | :20                                       | .12                  | .91              | :31              | .0241           | .0193                                                     |          |       |       |      |        |       |        |      |  |
| 7-18                                                                                                                                                                                                                                                                                                                                                           | .58                   | 0                  | :28                                       | .68                  | 1.00             | :33              | .0312           | .0203                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    | :30                                       | 3.00                 | 1.10             | :35              | .0380           | .0214                                                     |          |       |       |      |        |       |        |      |  |
| 6-30-58                                                                                                                                                                                                                                                                                                                                                        | Raingage R-10<br>.53  | T                  | :40                                       | 1.50                 | 1.35             | :55              | .0207           | .0305                                                     |          |       |       |      |        |       |        |      |  |
| 7-5                                                                                                                                                                                                                                                                                                                                                            | .41                   | 0                  | :50                                       | 2.70                 | 1.80             | 8:03             | .0141           | .0327                                                     |          |       |       |      |        |       |        |      |  |
| 7-14                                                                                                                                                                                                                                                                                                                                                           | .50                   | .02                | 8:00                                      | 1.80                 | 2.10             | :06              | .0207           | .0335                                                     |          |       |       |      |        |       |        |      |  |
| 7-18                                                                                                                                                                                                                                                                                                                                                           | .60                   | 0                  | :02                                       | 3.00                 | 2.20             | :08              | .0359           | .0345                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    | :21                                       | .60                  | 2.40             | :10              | .0467           | .0359                                                     |          |       |       |      |        |       |        |      |  |
| Watershed Conditions: 80% of area is bare, Sparse vegetation is composed almost entirely of shrubs (creosotebush, snakeweed, cactus, and mesquite) except for trace of short grasses.                                                                                                                                                                          |                       |                    | :30                                       | .67                  | 2.50             | :15              | .0689           | .0407                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    | :50                                       | .56                  | 2.64             | :23              | .0897           | .0513                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    | 9:00                                      | .30                  | 2.69             | :34              | .1102           | .0696                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    | :30                                       | .12                  | 2.75             | :41              | .1339           | .0838                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    | 10:02                                     | .04                  | 2.77             | :48              | .1716           | .0991                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    | :30                                       | .17                  | 2.85             | :56              | .1443           | .1201                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    | 11:08                                     | .16                  | 2.93             | 9:05             | .0847           | .1378                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    |                                           |                      |                  | :15              | .0551           | .1491                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    |                                           |                      |                  | :25              | .0389           | .1560                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    |                                           |                      |                  | :46              | .0307           | .1681                                                     |          |       |       |      |        |       |        |      |  |
|                                                                                                                                                                                                                                                                                                                                                                |                       |                    |                                           |                      |                  | 11:46            | 0               | .1722                                                     |          |       |       |      |        |       |        |      |  |
| Notes: To convert runoff in in/hr. to cfs, multiply by 770.36.                                                                                                                                                                                                                                                                                                 |                       |                    |                                           |                      |                  |                  |                 |                                                           |          |       |       |      |        |       |        |      |  |

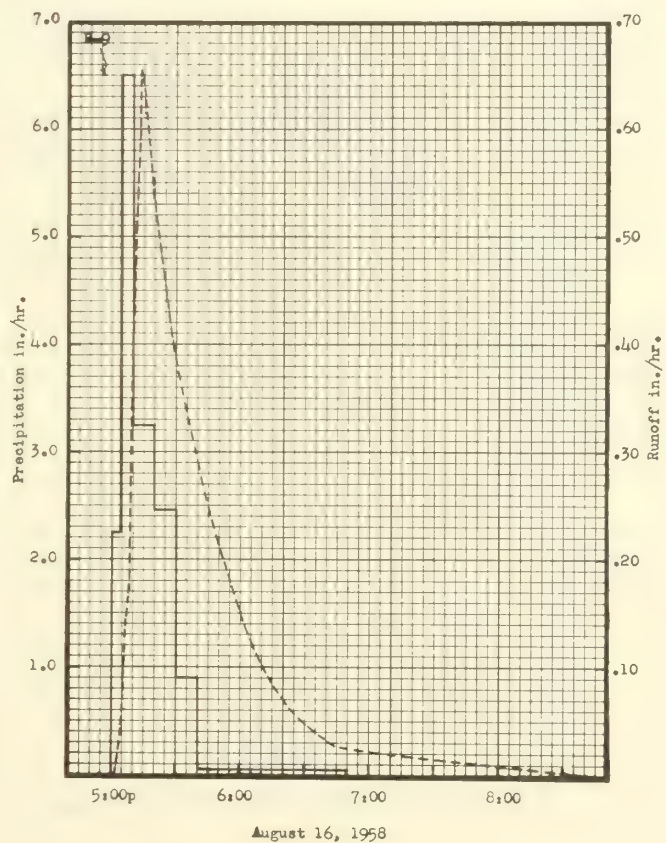
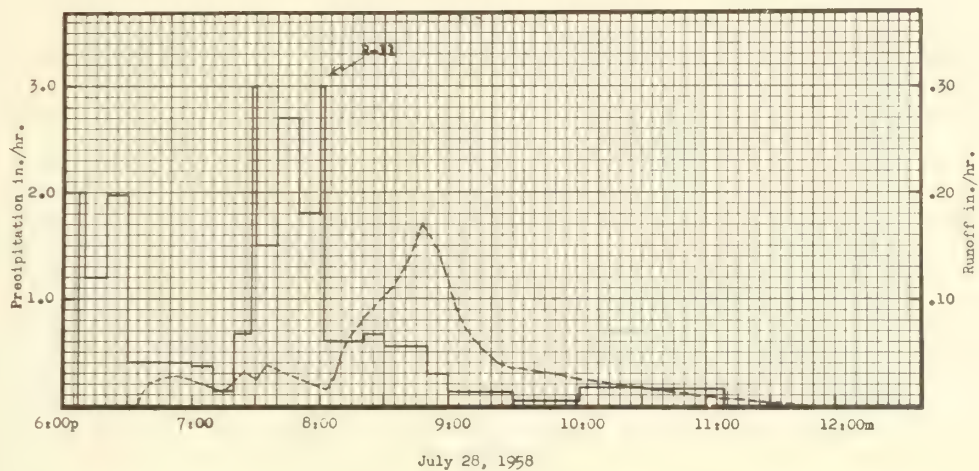
Cooperative Research Project of USDA and Arizona Agricultural Experiment Station



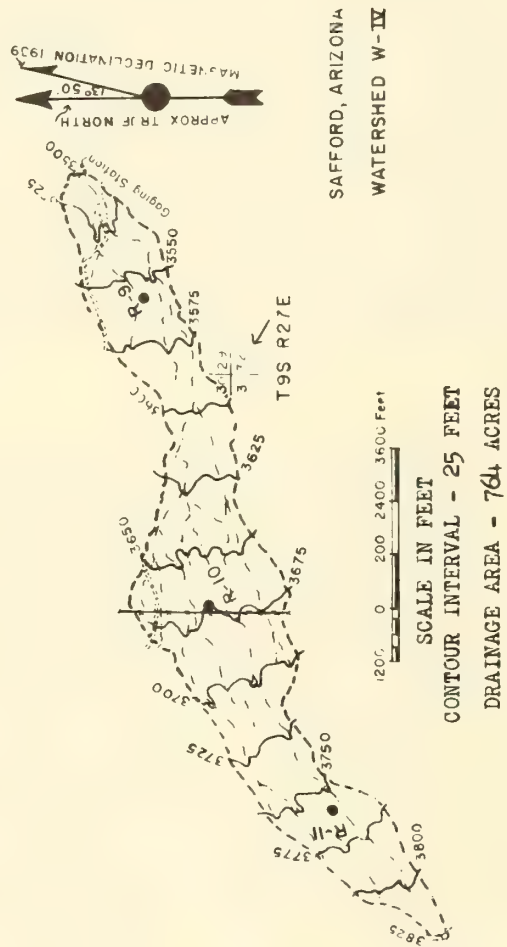
| SELECTED RUNOFF EVENTS                                                                                                                                                                       |                      |                    |                  |                      |                  | Safford, Arizona Watershed W-IV |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|---------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                        |                      |                    | Rainfall         |                      |                  | Runoff                          |                 |                  |
| Date                                                                                                                                                                                         | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 16, 1958                                                                                                                                                                     |                      |                    |                  |                      |                  |                                 |                 |                  |
| 7-18-58                                                                                                                                                                                      | Rainage R-9<br>.58   | 0                  | 8-16-58<br>5:00p | Rainage<br>0         | R-9<br>0         | 8-16-58<br>5:02p                | 0               | 0                |
| 7-28                                                                                                                                                                                         | 2.30                 | .17                | :04              | 2.25                 | .15              | :04                             | .0467           | .0002            |
| 8-3                                                                                                                                                                                          | .15                  | 0                  | :10              | 6.50                 | .80              | :05                             | .0776           | .0012            |
| 8-10                                                                                                                                                                                         | .07                  | 0                  | :20              | 3.24                 | 1.34             | :07                             | .1443           | .0049            |
| 7-18-58                                                                                                                                                                                      | Rainage R-10<br>.60  | 0                  | :30              | 2.46                 | 1.75             | :08                             | .1794           | .0077            |
| 7-28                                                                                                                                                                                         | 0                    | .17                | :40              | .90                  | 1.90             | :09                             | .2886           | .0115            |
| 8-3                                                                                                                                                                                          | .17                  | 0                  | 6:50             | .05                  | 1.96             | :10                             | .4082           | .0173            |
| 8-10                                                                                                                                                                                         | .08                  | 0                  |                  |                      |                  | :11                             | .4342           | .0243            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :12                             | .5148           | .0321            |
| 7-18-58                                                                                                                                                                                      | Rainage R-11<br>.46  | 0                  |                  |                      |                  | :13                             | .5980           | .0414            |
| 7-28                                                                                                                                                                                         | 3.03                 | .17                |                  |                      |                  | :14                             | e.6565          | .0518            |
| 8-3                                                                                                                                                                                          | .06                  | 0                  |                  |                      |                  | :15                             | .6383           | .0625            |
| 8-10                                                                                                                                                                                         | .14                  | 0                  |                  |                      |                  | :20                             | .5317           | .1113            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :25                             | .4524           | .1524            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :29                             | .3991           | .1804            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :40                             | .2886           | .2438            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :50                             | .2132           | .2856            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | 6:00                            | .1508           | .3159            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :04                             | .1313           | .3253            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :07                             | .1170           | .3315            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :15                             | .0872           | .3451            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :25                             | .0589           | .3573            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :32                             | .0467           | .3635            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | :44                             | .0259           | .3707            |
|                                                                                                                                                                                              |                      |                    |                  |                      |                  | 8:44                            | 0               | .3745            |
| <p>Watershed Conditions: 80% of area is bare. Sparse vegetation is composed almost entirely of shrubs (creosotebush, snakeweed, cactus, and mesquite) except for trace of short grasses.</p> |                      |                    |                  |                      |                  |                                 |                 |                  |

Notes: To convert runoff in in/hr. to cfs, multiply by 770.36.

e Partially estimated from this point on.



SAFFORD, ARIZONA WATERSHED W-IV



SAFFORD, ARIZONA  
WATERSHED W-IV

6-60

| MONTHLY PRECIPITATION AND RUNOFF (Inches) $\frac{1}{2}$ |      |      |      |      |      |      |      | Safford, Arizona Watershed W-V<br>Area - 723 acres |       |      |      |      |       |  |
|---------------------------------------------------------|------|------|------|------|------|------|------|----------------------------------------------------|-------|------|------|------|-------|--|
| Month<br>Year                                           | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug.                                               | Sept. | Oct. | Nov. | Dec. | Year  |  |
| 1956<br>P                                               | 0.30 | 0.18 | 0    | 0.18 | 0.24 | 0.64 | 3.20 | 1.00                                               | 0     | 0.24 | 0    | 0.14 | 6.12  |  |
| Q                                                       | 0    | 0    | 0    | 0    | 0    | 0    | .01  | .54                                                | 0     | 0    | 0    | 0    | .55   |  |
| 1957<br>P                                               | 1.87 | .53  | .70  | .17  | .42  | .57  | 2.39 | 3.30                                               | .07   | 1.04 | .30  | .34  | 11.70 |  |
| Q                                                       | 0    | 0    | 0    | 0    | 0    | .02  | .14  | .31                                                | 0     | 0    | 0    | 0    | .47   |  |
| 1958<br>P                                               | 0    | 1.41 | 1.98 | .50  | .16  | .58  | 1.41 | 1.47                                               | 1.19  | .78  | .29  | 0    | 9.77  |  |
| Q                                                       | 0    | 0    | 0    | 0    | 0    | 0    | .01  | 0                                                  | 0     | 0    | 0    | 0    | .01   |  |
| 1959<br>P                                               | .02  | .77  | 0    | .06  | 0    | .03  | 2.10 | 2.74                                               | .15   | 1.11 | .91  | .85  | 8.74  |  |
| Q                                                       | 0    | 0    | 0    | 0    | 0    | 0    | 0    | .05                                                | 0     | T    | 0    | 0    | .05   |  |

| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS |                   |      |                                           |      |         |      |         |      |          | Safford, Arizona Watershed W-V |       |      |        |      |        |      |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|----------|--------------------------------|-------|------|--------|------|--------|------|--|
| YEAR                                                                                                                    | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |          |                                |       |      |        |      |        |      |  |
|                                                                                                                         |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours |                                | 1 day |      | 2 days |      | 8 days |      |  |
|                                                                                                                         | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date     | Vol.                           | Date  | Vol. | Date   | Vol. | Date   | Vol. |  |
| 1956                                                                                                                    | 8-15              | 0.15 | 8-4                                       | 0.08 | 8-15    | 0.13 | 8-15    | 0.22 | 8-15     | 0.22                           | 8-15  | 0.22 | 8-14   | 0.35 | 8-14   | 0.35 |  |
| 1957                                                                                                                    | 8-30              | .36  | 8-30                                      | .14  | 8-30    | .16  | 8-30    | .16  | 8-30     | .16                            | 8-30  | .16  | 8-28   | .26  | 8-28   | .26  |  |
| 1958                                                                                                                    | 7-30              | .01  | 7-30                                      | T    | 7-30    | .01  | 7-30    | .01  | 7-30     | .01                            | 7-30  | .01  | 7-30   | .01  | 7-30   | .01  |  |
| 1959                                                                                                                    | 8-1               | .03  | 8-1                                       | .01  | 8-1     | .02  | 8-1     | .04  | 8-1      | .04                            | 8-1   | .04  | 8-1    | .04  | 8-1    | .04  |  |

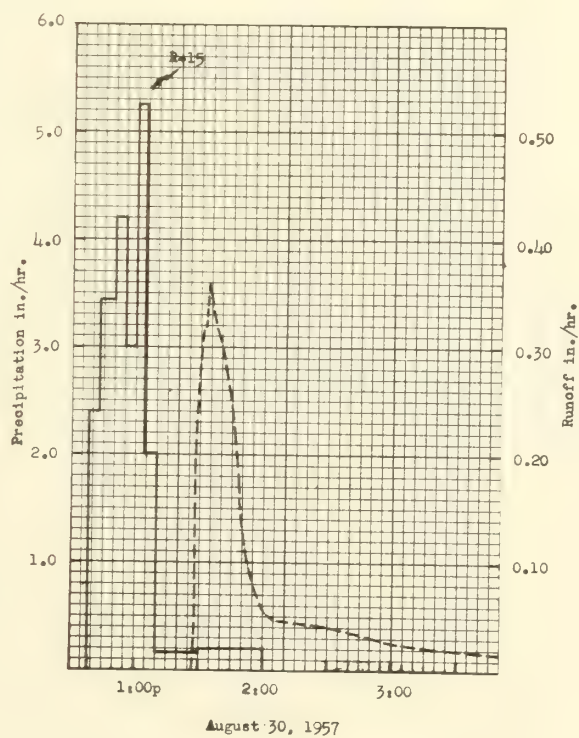
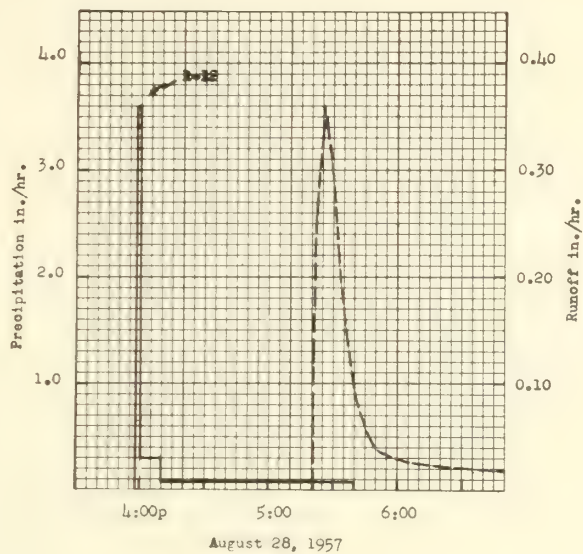
Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volume, excellent. Watershed conditions: About 80% of area is bare. Vegetation consists mostly of short grasses (black grama, side-cats grama, and tabosa), with some shrubs and forbs.  $\frac{1}{2}$  All monthly P values weighted by Thiessen method, using 4 raingages.

| SELECTED RUNOFF EVENTS                     |                       |                 |                  |                   | Safford, Arizona Watershed W-V |                  |              |              |
|--------------------------------------------|-----------------------|-----------------|------------------|-------------------|--------------------------------|------------------|--------------|--------------|
| Antecedent conditions                      |                       |                 | Rainfall         |                   |                                | Runoff           |              |              |
| Date                                       | Rainfall (inches)     | Runoff (inches) | Date and time    | Intensity (in/hr) | Acc. (inches)                  | Date and time    | Rate (in/hr) | Acc (inches) |
| Event of August 28, 1957                   |                       |                 |                  |                   |                                |                  |              |              |
| 8-4-57                                     | Raingage R-12<br>0.25 | 0               | 8-28-57<br>3:58p | Raingage<br>0     | R-12 1/<br>0                   | 8-28-57<br>5:21p | 0            | 0            |
| 8-5                                        | .40                   | 0               | 4:00             | 3.60              | .12                            | :22              | .2041        | .0020        |
| 8-13                                       | .25                   | .05             | :10              | .30               | .17                            | :24              | .3069        | .0105        |
| 8-19                                       | .24                   | 0               | 5:40             | .09               | .20                            | :25              | .3288        | .0158        |
| 8-4-57                                     | Raingage R-13<br>.09  | 0               |                  |                   |                                | :26              | .3603        | .0215        |
| 8-5                                        | .44                   | 0               |                  |                   |                                | :30              | .2959        | .0434        |
| 8-10                                       | .15                   | 0               |                  |                   |                                | :32              | .2356        | .0522        |
| 8-13                                       | .60                   | .05             |                  |                   |                                | :35              | .1754        | .0622        |
|                                            |                       |                 |                  |                   |                                | :40              | .0972        | .0736        |
| 8-19                                       | .15                   | 0               |                  |                   |                                | :50              | .0403        | .0838        |
| 8-22                                       | .12                   | 0               |                  |                   |                                | :55              | .0323        | .0868        |
| 8-25                                       | .10                   | 0               |                  |                   |                                | 6:05             | .0282        | .0918        |
|                                            |                       |                 |                  |                   |                                | 8:38             | 0            | .0962        |
| 8-4                                        | Raingage R-14<br>.10  | 0               |                  |                   |                                |                  |              |              |
| 8-5                                        | .55                   | 0               |                  |                   |                                |                  |              |              |
| 8-10                                       | .15                   | 0               |                  |                   |                                |                  |              |              |
| 8-13                                       | .80                   | .05             |                  |                   |                                |                  |              |              |
| 8-15                                       | .31                   | 0               |                  |                   |                                |                  |              |              |
| 8-17                                       | .29                   | 0               |                  |                   |                                |                  |              |              |
| 8-19                                       | .14                   | 0               |                  |                   |                                |                  |              |              |
| 8-22                                       | .14                   | 0               |                  |                   |                                |                  |              |              |
| 8-25                                       | .09                   | 0               |                  |                   |                                |                  |              |              |
| Watershed Conditions:<br>(See Notes above) |                       |                 |                  |                   |                                |                  |              |              |

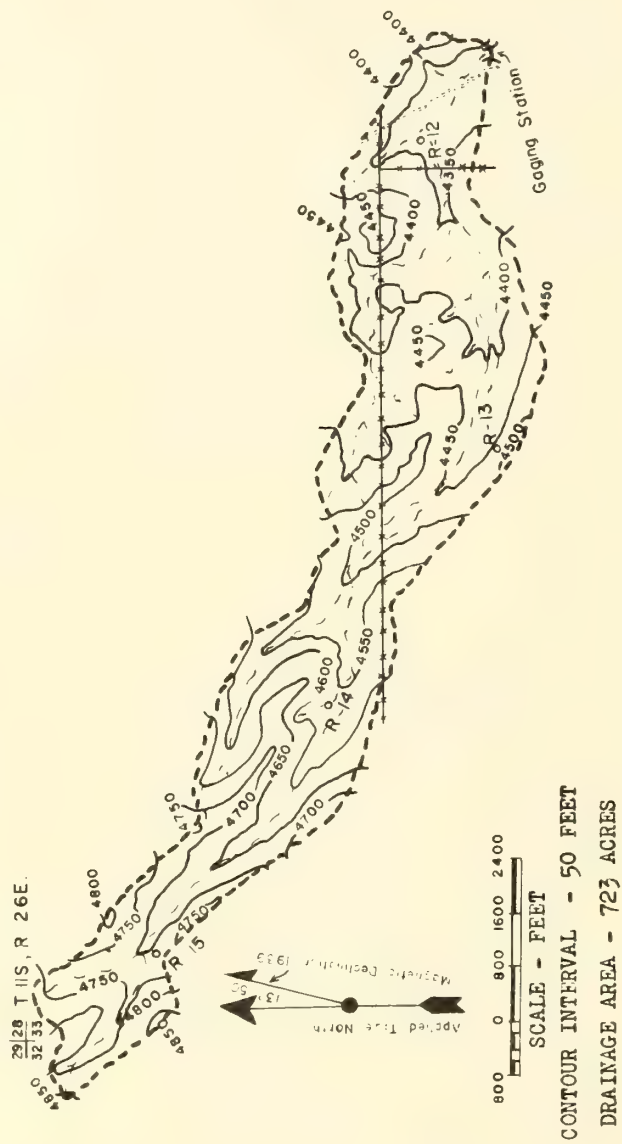
Notes: To convert runoff in in/hr. to cfs, multiply by 729.02.  
 $\frac{1}{2}$  Weekly Raingage R-13 recorded 0.80 rainfall.



| SELECTED RUNOFF EVENTS                                                                                                                                                      |                       |                    |                   |                      |                  | Safford, Arizona Watershed W-V |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|-------------------|----------------------|------------------|--------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                       |                       |                    | Rainfall          |                      |                  | Runoff                         |                 |                  |
| Date                                                                                                                                                                        | Rainfall<br>(inches)  | Runoff<br>(inches) | Date and<br>time  | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time               | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 30, 1957                                                                                                                                                    |                       |                    |                   |                      |                  |                                |                 |                  |
| 8-4-57                                                                                                                                                                      | Raingage R-15<br>0.56 | 0                  | 8-30-57<br>12:38p | Raingage<br>0        | R-15<br>0        | 8-30-57<br>1:27p               | 0               | 0                |
| 8-5                                                                                                                                                                         | .57                   | 0                  | :43               | 2.40                 | .20              | :28                            | .2041           | .0024            |
| 8-13                                                                                                                                                                        | 1.20                  | .05                | :50               | 3.43                 | .60              | :30                            | .2836           | .0106            |
| 8-19                                                                                                                                                                        | .45                   | 0                  | :55               | 4.20                 | .95              | :32                            | .3178           | .0207            |
| 8-22                                                                                                                                                                        | .18                   | 0                  | 1:00              | 3.00                 | 1.20             | :33                            | .3233           | .0261            |
| 8-25                                                                                                                                                                        | .14                   | 0                  | :04               | 5.25                 | 1.55             | :34                            | .3603           | .0318            |
| 8-28                                                                                                                                                                        | .18                   | .10                | :10               | 2.00                 | 1.75             | :35                            | .3452           | .0377            |
|                                                                                                                                                                             |                       |                    | :30               | .15                  | 1.80             | :37                            | .3233           | .0489            |
|                                                                                                                                                                             |                       |                    | 2:00              | .20                  | 1.90             | :40                            | .3014           | .0645            |
| 8-4                                                                                                                                                                         | Raingage R-14<br>.10  | 0                  |                   |                      |                  | :46                            | .2260           | .0924            |
| 8-5                                                                                                                                                                         | .55                   | 0                  |                   |                      |                  | :49                            | .1644           | .1022            |
| 8-10                                                                                                                                                                        | .15                   | 0                  |                   |                      |                  | :54                            | .0918           | .1129            |
| 8-13                                                                                                                                                                        | .80                   | .05                |                   |                      |                  | 2:00                           | .0592           | .1204            |
| 8-15                                                                                                                                                                        | .31                   | 0                  |                   |                      |                  | :05                            | .0493           | .1249            |
| 8-17                                                                                                                                                                        | .29                   | 0                  |                   |                      |                  |                                |                 |                  |
| 8-19                                                                                                                                                                        | .14                   | 0                  |                   |                      |                  | :28                            | .0411           | .1419            |
| 8-22                                                                                                                                                                        | .14                   | 0                  |                   |                      |                  | :49                            | .0310           | .1549            |
| 8-25                                                                                                                                                                        | .09                   | 0                  |                   |                      |                  | 3:00                           | .0268           | .1602            |
| 8-28                                                                                                                                                                        | .21                   | .10                |                   |                      |                  | 5:32                           | 0               | .1643            |
| 8-4                                                                                                                                                                         | Raingage R-13<br>.09  | 0                  |                   |                      |                  |                                |                 |                  |
| 8-5                                                                                                                                                                         | .44                   | 0                  |                   |                      |                  |                                |                 |                  |
| 8-10                                                                                                                                                                        | .15                   | 0                  |                   |                      |                  |                                |                 |                  |
| 8-13                                                                                                                                                                        | .60                   | .05                |                   |                      |                  |                                |                 |                  |
| 8-19                                                                                                                                                                        | .15                   | 0                  |                   |                      |                  |                                |                 |                  |
| 8-22                                                                                                                                                                        | .12                   | 0                  |                   |                      |                  |                                |                 |                  |
| 8-25                                                                                                                                                                        | .10                   | 0                  |                   |                      |                  |                                |                 |                  |
| 8-28                                                                                                                                                                        | .80                   | .10                |                   |                      |                  |                                |                 |                  |
| 8-4                                                                                                                                                                         | Raingage R-12<br>.25  | 0                  |                   |                      |                  |                                |                 |                  |
| 8-5                                                                                                                                                                         | .40                   | 0                  |                   |                      |                  |                                |                 |                  |
| 8-13                                                                                                                                                                        | .25                   | .05                |                   |                      |                  |                                |                 |                  |
| 8-19                                                                                                                                                                        | .24                   | 0                  |                   |                      |                  |                                |                 |                  |
| 8-28                                                                                                                                                                        | .20                   | .10                |                   |                      |                  |                                |                 |                  |
| <u>Watershed Conditions:</u> About 80% of area is bare. Vegetation consists mostly of short grasses (black grama, side-oats grama, and tabosa), with some shrubs and forbs. |                       |                    |                   |                      |                  |                                |                 |                  |
| Notes: To convert runoff in in/hr. to cfs, multiply by 729.02                                                                                                               |                       |                    |                   |                      |                  |                                |                 |                  |



SAFFORD, ARIZONA WATERSHED W-V



SAFFORD, ARIZONA  
WATERSHED W-V

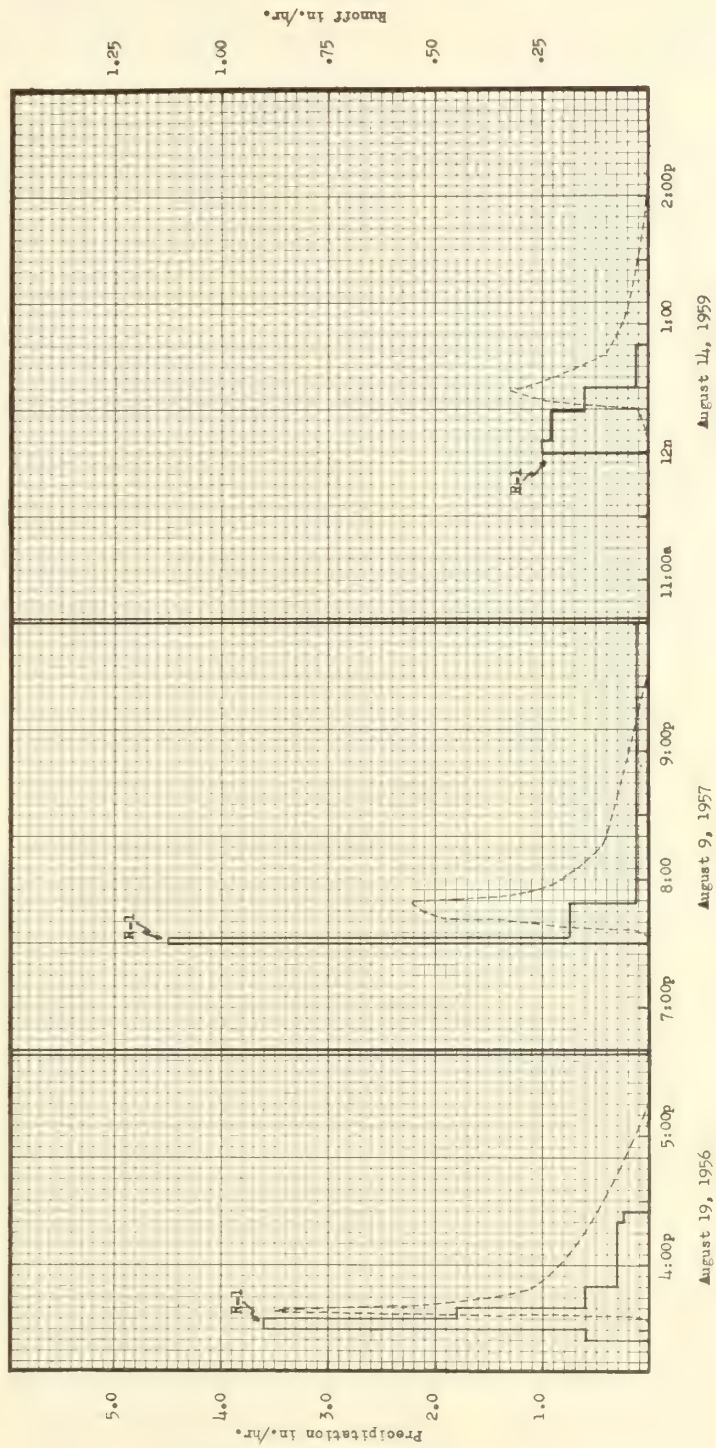
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                           |                   |                 |                                           |               |                   |               |         | Albuquerque, New Mexico Watershed W-I<br>Area - 97.2 acres |              |               |       |      |        |      |        |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|---------------|-------------------|---------------|---------|------------------------------------------------------------|--------------|---------------|-------|------|--------|------|--------|------|
| Year                                                                                                                                                                                                                                                                                                | Month             | Jan.            | Feb.                                      | Mar.          | Apr.              | May           | June    | July                                                       | Aug.         | Sept.         | Oct.  | Nov. | Dec.   | Year |        |      |
| 1956                                                                                                                                                                                                                                                                                                | P                 | 0.17            | 0.26                                      | 0             | 0                 | 0             | 0.47    | 1.09                                                       | 1.11         | 0             | 0.23  | 0    | 0      | 3.33 |        |      |
|                                                                                                                                                                                                                                                                                                     | Q                 | 0               | 0                                         | 0             | 0                 | 0             | 0       | T                                                          | .17          | 0             | 0     | 0    | 0      | .17  |        |      |
| 1957                                                                                                                                                                                                                                                                                                | P                 | .23             | .84                                       | .87           | .18               | .39           | .37     | 1.34                                                       | 3.24         | 0             | 1.49  | .52  | 0      | 9.47 |        |      |
|                                                                                                                                                                                                                                                                                                     | Q                 | 0               | 0                                         | 0             | 0                 | 0             | 0       | 0                                                          | .72          | 0             | .27   | 0    | 0      | .99  |        |      |
| 1958                                                                                                                                                                                                                                                                                                | P                 | .70             | .08                                       | .94           | .81               | .02           | .27     | 0                                                          | 1.97         | 1.06          | .99   | 0    | .35    | 7.19 |        |      |
|                                                                                                                                                                                                                                                                                                     | Q                 | 0               | 0                                         | 0             | 0                 | 0             | 0       | 0                                                          | .45          | .14           | 0     | 0    | 0      | .59  |        |      |
| 1959                                                                                                                                                                                                                                                                                                | P                 | .12             | 0                                         | .06           | .59               | .35           | .63     | 1.13                                                       | 1.70         | 0             | 1.34  | 0    | .72    | 6.64 |        |      |
|                                                                                                                                                                                                                                                                                                     | Q                 | 0               | 0                                         | 0             | 0                 | 0             | .05     | .17                                                        | .13          | 0             | .08   | 0    | 0      | .43  |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                             |                   |                 |                                           |               |                   |               |         | Albuquerque, New Mexico Watershed W-I                      |              |               |       |      |        |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |               |                   |               |         |                                                            |              |               |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     |                   |                 | 1 hour                                    |               | 2 hours           |               | 6 hours |                                                            | 12 hours     |               | 1 day |      | 2 days |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                     | Date              | Rate            | Date                                      | Vol.          | Date              | Vol.          | Date    | Vol.                                                       | Date         | Vol.          | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1956                                                                                                                                                                                                                                                                                                | 8-19              | 0.87            | 8-19                                      | 0.14          | 8-19              | 0.17          | 8-19    | 0.17                                                       | 8-19         | 0.17          | 8-19  | 0.17 | 8-19   | 0.17 | 8-19   | 0.17 |
| 1957                                                                                                                                                                                                                                                                                                | 8-24              | 2.33            | 8-24                                      | .57           | 8-24              | .62           | 8-24    | .62                                                        | 8-24         | .62           | 8-24  | .62  | 8-24   | .62  | 8-16   | .66  |
| 1958                                                                                                                                                                                                                                                                                                | 8-21              | .70             | 8-21                                      | .19           | 8-21              | .34           | 8-21    | .36                                                        | 8-21         | .36           | 8-21  | .36  | 8-21   | .36  | 8-21   | .36  |
| 1959                                                                                                                                                                                                                                                                                                | 8-14              | .32             | 8-14                                      | .11           | 8-14              | .13           | 8-14    | .13                                                        | 8-14         | .13           | 8-14  | .13  | 8-14   | .13  | 8-14   | .13  |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volume, excellent. Watershed conditions: Rough broken Rangeland. About 85% of area is bare. Sparse vegetation consists of short grasses (blue and black grama), shrubs, and a few small juniper and pinion trees. |                   |                 |                                           |               |                   |               |         |                                                            |              |               |       |      |        |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                              |                   |                 |                                           |               |                   |               |         | Albuquerque, New Mexico Watershed W-I                      |              |               |       |      |        |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                               |                   |                 |                                           | Rainfall      |                   |               |         | Runoff                                                     |              |               |       |      |        |      |        |      |
| Date                                                                                                                                                                                                                                                                                                | Rainfall (inches) | Runoff (inches) |                                           | Date and time | Intensity (in/hr) | Acc. (inches) |         | Date and time                                              | Rate (in/hr) | Acc. (inches) |       |      |        |      |        |      |
| Event of August 19, 1956                                                                                                                                                                                                                                                                            |                   |                 |                                           |               |                   |               |         |                                                            |              |               |       |      |        |      |        |      |
| 7-18-56                                                                                                                                                                                                                                                                                             | Raingage R-1      |                 |                                           | 8-19-56       | Raingage          | R-1           |         | 8-19-56                                                    |              |               |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     | 0.32              | 0.001           |                                           | 3:25p         | 0                 | 0             |         | 3:33p                                                      | 0            | 0             |       |      |        |      |        |      |
| 7-19                                                                                                                                                                                                                                                                                                | .23               | 0               |                                           | :30           | .60               | .05           |         | :36                                                        | .238         | .002          |       |      |        |      |        |      |
| 7-28                                                                                                                                                                                                                                                                                                | .20               | 0               |                                           | :35           | 3.60              | .35           |         | :38                                                        | .871         | .021          |       |      |        |      |        |      |
| 7-29                                                                                                                                                                                                                                                                                                | .02               | 0               |                                           | :40           | 1.80              | .50           |         | :40                                                        | .732         | .048          |       |      |        |      |        |      |
| 7-31                                                                                                                                                                                                                                                                                                | .21               | 0               |                                           | :50           | .60               | .60           |         | :41                                                        | .594         | .070          |       |      |        |      |        |      |
| 8-1                                                                                                                                                                                                                                                                                                 | .42               | 0               |                                           | 4:00          | .30               | .65           |         | :44                                                        | .381         | .094          |       |      |        |      |        |      |
| 8-16                                                                                                                                                                                                                                                                                                | .10               | 0               |                                           | :10           | .30               | .70           |         | :49                                                        | e .264       | .121          |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     |                   |                 |                                           | :20           | .30               | .75           |         | 5:13                                                       | 0            | .174          |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     |                   |                 |                                           | :25           | .24               | .77           |         |                                                            |              |               |       |      |        |      |        |      |
| Watershed Conditions:<br>See Notes above.                                                                                                                                                                                                                                                           |                   |                 |                                           |               |                   |               |         |                                                            |              |               |       |      |        |      |        |      |
| Event of August 9, 1957                                                                                                                                                                                                                                                                             |                   |                 |                                           |               |                   |               |         |                                                            |              |               |       |      |        |      |        |      |
| 7-12-57                                                                                                                                                                                                                                                                                             | Raingage R-1      |                 |                                           | 8-9-57        | Raingage          | R-1           |         | 8-9-57                                                     |              |               |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     | 0.20              | 0               |                                           | 7:30p         | 0                 | 0             |         | 7:32p                                                      | 0            | 0             |       |      |        |      |        |      |
| 7-13                                                                                                                                                                                                                                                                                                | .01               | 0               |                                           | :32           | 4.50              | .15           |         | :36                                                        | .048         | .002          |       |      |        |      |        |      |
| 7-15                                                                                                                                                                                                                                                                                                | .08               | 0               |                                           | :40           | .75               | .25           |         | :37                                                        | .199         | .005          |       |      |        |      |        |      |
| 7-17                                                                                                                                                                                                                                                                                                | .20               | 0               |                                           | :48           | .75               | .35           |         | :38                                                        | .238         | .010          |       |      |        |      |        |      |
| 7-21                                                                                                                                                                                                                                                                                                | .11               | 0               |                                           | 8:27          | .11               | .42           |         | :40                                                        | .320         | .019          |       |      |        |      |        |      |
| 7-25                                                                                                                                                                                                                                                                                                | .20               | 0               |                                           | 9:20          | .12               | .53           |         | :41                                                        | .380         | .025          |       |      |        |      |        |      |
| 7-26                                                                                                                                                                                                                                                                                                | .18               | 0               |                                           | 10:00         | .14               | .62           |         | :42                                                        | .462         | .032          |       |      |        |      |        |      |
| 8-1                                                                                                                                                                                                                                                                                                 | .18               | 0               |                                           | :55           | .11               | .72           |         | :45                                                        | .525         | .040          |       |      |        |      |        |      |
| 8-6                                                                                                                                                                                                                                                                                                 | .05               | 0               |                                           | 11:00         | .36               | .75           |         | :48                                                        | .551         | .049          |       |      |        |      |        |      |
| Watershed Conditions:<br>See Notes above.                                                                                                                                                                                                                                                           |                   |                 |                                           |               |                   |               |         |                                                            |              |               |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     |                   |                 |                                           | :45           | .09               | .82           |         | :52                                                        | .392         | .057          |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |         | :57                                                        | .238         | .068          |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |         | 8:02                                                       | .196         | .072          |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |         | :12                                                        | .134         | .077          |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |         | :17                                                        | .123         | .079          |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |               |                   |               |         | 9:35                                                       | 0            | .106          |       |      |        |      |        |      |
| Notes: To convert runoff in in/hr. to cfs multiply by 98.009. e Partially estimated. For watershed map see Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS-SWC, January 1960, page 47.1-4.                                                                       |                   |                 |                                           |               |                   |               |         |                                                            |              |               |       |      |        |      |        |      |

Cooperative Research Project of USDA and New Mexico Agricultural Experiment Station.



| SELECTED RUNOFF EVENTS                                                                                                                                                                                         |                      |                    |                  |                      |                  | Albuquerque, New Mexico Watershed W-I |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|---------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                          |                      |                    | Rainfall         |                      |                  | Runoff                                |                 |                  |
| Date                                                                                                                                                                                                           | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                      | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 14, 1959                                                                                                                                                                                       |                      |                    |                  |                      |                  |                                       |                 |                  |
|                                                                                                                                                                                                                | Raingage R-1         |                    | 8-14-59          | Raingage             | R-1              | 8-14-59                               |                 |                  |
| 7-22-59                                                                                                                                                                                                        | 0.25                 | 0                  | 11:59a           | 0                    | 0                | 12:01p                                | 0               | 0                |
| 7-30                                                                                                                                                                                                           | .35                  | .075               | 12:05p           | 1.00                 | .10              | :17                                   | .014            | .0009            |
| 8-5                                                                                                                                                                                                            | .25                  | 0                  | :18              | .92                  | .30              | :20                                   | .032            | .002             |
| 8-9                                                                                                                                                                                                            | .57                  | 0                  | :30              | .60                  | .41              | :21                                   | .112            | .003             |
| Watershed Conditions: Rough, broken<br>rangeland. About 85% of area is bare.<br>Sparse vegetation consists of short<br>grasses (blue and black grama), shrubs,<br>and a few small juniper and pinion<br>trees. |                      |                    | :50              | .12                  | .45              | :23                                   | .238            | .009             |
|                                                                                                                                                                                                                |                      |                    | 1:15             | .12                  | .50              | :29                                   | .324            | .037             |
|                                                                                                                                                                                                                |                      |                    | :40              | .12                  | .55              | :34                                   | .238            | .060             |
|                                                                                                                                                                                                                |                      |                    |                  |                      |                  | :45                                   | .114            | .093             |
|                                                                                                                                                                                                                |                      |                    |                  |                      |                  | 1:00                                  | .061            | .115             |
|                                                                                                                                                                                                                |                      |                    |                  |                      |                  | 2:12                                  | 0               | .127             |
|                                                                                                                                                                                                                |                      |                    |                  |                      |                  |                                       |                 |                  |
| Notes: To convert runoff in in/hr. to cfs, multiply by 98.009.                                                                                                                                                 |                      |                    |                  |                      |                  |                                       |                 |                  |

ALBUQUERQUE, NEW MEXICO WATERSHED W-1

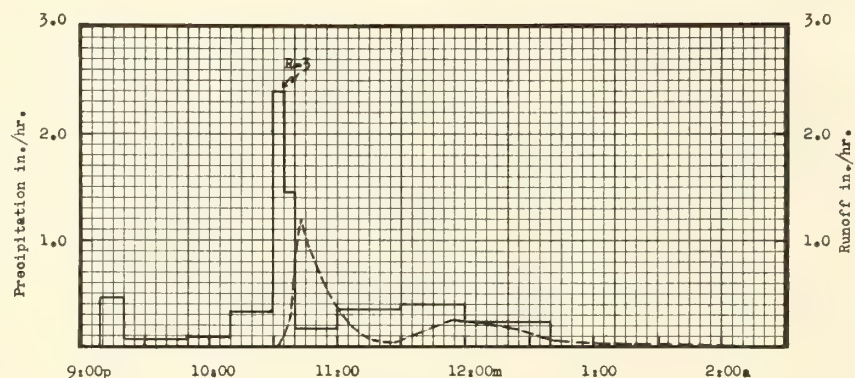


| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                      |                   |           |                                           |                          |                   |               |             | Albuquerque, New Mexico Watershed II<br>Area - 40.5 acres |              |             |               |          |              |      |        |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------|-------------------------------------------|--------------------------|-------------------|---------------|-------------|-----------------------------------------------------------|--------------|-------------|---------------|----------|--------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                  | Jan.              | Feb.      | Mar.                                      | Apr.                     | May               | June          | July        | Aug.                                                      | Sept.        | Oct.        | Nov.          | Dec.     | Year         |      |        |      |
| 1956                                                                                                                                                                                                                                                                                                                                                                           | P<br>Q            | 0.23<br>0 | 0.15<br>0                                 | 0<br>0                   | 0<br>0            | 0.30<br>0     | 0.83<br>0   | 0.94<br>.08                                               | 0<br>0       | 0.32<br>0   | 0<br>0        | 0<br>0   | 2.77<br>.08  |      |        |      |
| 1957                                                                                                                                                                                                                                                                                                                                                                           | P<br>Q            | .24<br>0  | .72<br>0                                  | 1.03<br>0                | .17<br>0          | .56<br>0      | .46<br>.01  | 1.22<br>.15                                               | 2.67<br>.91  | .04<br>0    | 1.80<br>.15   | .34<br>0 | 9.25<br>1.22 |      |        |      |
| 1958                                                                                                                                                                                                                                                                                                                                                                           | P<br>Q            | .77<br>0  | .08<br>0                                  | .82<br>0                 | .83<br>0          | 0<br>0        | .36<br>0    | .05<br>0                                                  | 2.14<br>.59  | 1.35<br>.02 | 1.04<br>0     | 0<br>0   | 7.58<br>.61  |      |        |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                           | P<br>Q            | 0<br>0    | 0<br>0                                    | 0<br>0                   | .77<br>0          | .71<br>.13    | 1.01<br>.01 | .91<br>.19                                                | 1.71<br>.35  | 0<br>0      | 1.33<br>T     | 0<br>0   | 7.05<br>.68  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                        |                   |           |                                           |                          |                   |               |             | Albuquerque, New Mexico Watershed II                      |              |             |               |          |              |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                           | MAXIMUM DISCHARGE |           | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                          |                   |               |             |                                                           |              |             |               |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           | 1 hour                                    |                          | 2 hours           |               | 6 hours     |                                                           | 12 hours     |             | 1 day         |          | 2 days       |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                | Date              | Rate      | Date                                      | Vol.                     | Date              | Vol.          | Date        | Vol.                                                      | Date         | Vol.        | Date          | Vol.     | Date         | Vol. | Date   | Vol. |
| 1956                                                                                                                                                                                                                                                                                                                                                                           | 8-1               | 0.18      | 8-1                                       | 0.07                     | 8-1               | 0.08          | 8-1         | 0.08                                                      | 8-1          | 0.08        | 8-1           | 0.08     | 8-1          | 0.08 | 8-1    | 0.08 |
| 1957                                                                                                                                                                                                                                                                                                                                                                           | 8-24              | 2.79      | 8-24                                      | .73                      | 8-24              | .77           | 8-24        | .79                                                       | 8-24         | .79         | 8-24          | .79      | 8-24         | .79  | 8-24   | .79  |
| 1958                                                                                                                                                                                                                                                                                                                                                                           | 8-21              | 1.19      | 8-21                                      | .35                      | 8-22              | .54           | 8-22        | .59                                                       | 8-22         | .59         | 8-22          | .59      | 8-22         | .59  | 8-22   | .59  |
| 1959                                                                                                                                                                                                                                                                                                                                                                           | 8-14              | .54       | 8-14                                      | .24                      | 8-14              | .28           | 8-14        | .28                                                       | 8-14         | .28         | 8-14          | .28      | 8-14         | .28  | 8-14   | .28  |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volume, excellent. Watershed conditions: Sparsely vegetated rangeland. 80% of area is bare. Vegetation consists of short grasses (blue and black grama, and galleta) and shrubs (sagebrush, saltbush, and rabbit brush). Vegetation is densest along lower two thirds of principal waterway. |                   |           |                                           |                          |                   |               |             |                                                           |              |             |               |          |              |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                         |                   |           |                                           |                          |                   |               |             | Albuquerque, New Mexico Watershed II                      |              |             |               |          |              |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                          |                   |           |                                           | Rainfall                 |                   |               |             |                                                           | Runoff       |             |               |          |              |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                           | Rainfall (inches) |           | Runoff (inches)                           | Date and time            | Intensity (in/hr) | Acc. (inches) |             | Date and time                                             | Rate (in/hr) |             | Acc. (inches) |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           | Event of August 24, 1957 |                   |               |             |                                                           |              |             |               |          |              |      |        |      |
| 7-25-57                                                                                                                                                                                                                                                                                                                                                                        | Raingage R-3      |           | 0.18                                      | 0.12                     | 8-24-57           | Raingage      | R-3         | 8-24-57                                                   |              |             |               |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          | 11:59a            | 0             | 0           | 12:02p                                                    | 0            |             | 0             |          |              |      |        |      |
| 7-26                                                                                                                                                                                                                                                                                                                                                                           |                   |           | .34                                       | 0                        | 12:04p            | 2.40          | .20         | :05                                                       | .196         |             | .003          |          |              |      |        |      |
| 8-1                                                                                                                                                                                                                                                                                                                                                                            |                   |           | .22                                       | 0                        | :09               | 5.40          | .65         | :06                                                       | .314         |             | .007          |          |              |      |        |      |
| 8-6                                                                                                                                                                                                                                                                                                                                                                            |                   |           | .07                                       | 0                        | :14               | 2.40          | .85         | :07                                                       | .519         |             | .014          |          |              |      |        |      |
| 8-9                                                                                                                                                                                                                                                                                                                                                                            |                   |           | .75                                       | .12                      | :24               | .90           | 1.00        | :08                                                       | .811         |             | .025          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          | :34               | .72           | 1.12        | :09                                                       | 1.156        |             | .041          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          | :59               | .31           | 1.25        | :10                                                       | 2.053        |             | .068          |          |              |      |        |      |
| Watershed Conditions:                                                                                                                                                                                                                                                                                                                                                          |                   |           |                                           |                          | 1:44p             | .07           | 1.30        | :11                                                       | 2.524        |             | .106          |          |              |      |        |      |
| See Notes above                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :12                                                       | 2.793        |             | .151          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :15                                                       | 2.279        |             | .277          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :16                                                       | 1.847        |             | .312          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :17                                                       | 1.654        |             | .341          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :18                                                       | 1.411        |             | .367          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :20                                                       | 1.242        |             | .408          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :23                                                       | .938         |             | .458          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :25                                                       | .718         |             | .486          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :30                                                       | .554         |             | .543          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :33                                                       | .483         |             | .569          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :36                                                       | .510         |             | .594          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :45                                                       | .377         |             | .662          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :50                                                       | .309         |             | .691          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :56                                                       | .213         |             | .717          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | 1:00                                                      | .174         |             | .730          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :05                                                       | .135         |             | .743          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | :14                                                       | .111         |             | .761          |          |              |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                |                   |           |                                           |                          |                   |               |             | 2:26p                                                     | 0            |             | .786          |          |              |      |        |      |
| Notes: To convert runoff in in/hr. to cfs, multiply by 40.837.                                                                                                                                                                                                                                                                                                                 |                   |           |                                           |                          |                   |               |             |                                                           |              |             |               |          |              |      |        |      |

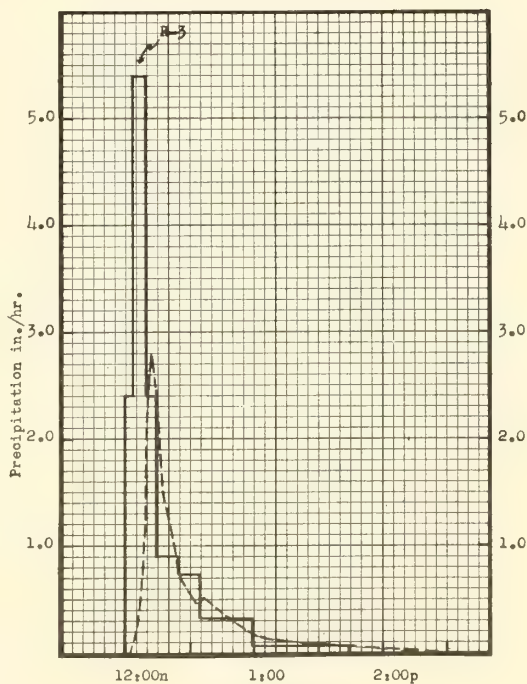
Cooperative Research Project of USDA and New Mexico Agricultural Experiment Station.

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | Albuquerque, New Mexico Watershed W-II |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                  |                      |                    | Rainfall         |                      |                  | Runoff                                 |                 |                  |
| Date                                                                                                                                                                                                                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                       | Rate<br>(in/hr) | Acc.<br>(inches) |
| <u>Event of August 21, 1958</u>                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  |                                        |                 |                  |
|                                                                                                                                                                                                                                                                                        | Raingage R-3         |                    | 8-21-58          | Raingage             | R-3              | 8-21-58                                |                 |                  |
| 8-4-58                                                                                                                                                                                                                                                                                 | 0.70                 | 0                  | 9:08p            | 0                    | 0                | 10:32p                                 | 0               | 0                |
| 8-12                                                                                                                                                                                                                                                                                   | .10                  | 0                  | :20              | .44                  | .08              | :30                                    | .127            | .006             |
| 8-16                                                                                                                                                                                                                                                                                   | .20                  | 0                  | :50              | .06                  | .11              | :38                                    | .314            | .012             |
| 8-20                                                                                                                                                                                                                                                                                   | .07                  | 0                  | 10:10            | .09                  | .14              | :40                                    | .835            | .028             |
| <u>Watershed Conditions:</u> Sparsely vegetated rangeland, with 80% of the area bare. Vegetation consists of short grasses (blue and black grama and galleta) and shrubs (Sagebrush, salt-bush, and rabbit brush). Vegetation is densest along lower two-thirds of principal waterway. |                      |                    | :30              | .33                  | .25              | :42                                    | 1.103           | .061             |
|                                                                                                                                                                                                                                                                                        |                      |                    | :35              | 2.40                 | .45              | :43                                    | 1.186           | .080             |
|                                                                                                                                                                                                                                                                                        |                      |                    | :40              | 1.44                 | .57              | :45                                    | 1.073           | .117             |
|                                                                                                                                                                                                                                                                                        |                      |                    | 11:00            | .18                  | .63              | :47                                    | .938            | .150             |
|                                                                                                                                                                                                                                                                                        |                      |                    | :30              | .34                  | .80              | :55                                    | .554            | .245             |
|                                                                                                                                                                                                                                                                                        |                      |                    | 8-22-58          |                      |                  | 11:05                                  | .224            | .308             |
|                                                                                                                                                                                                                                                                                        |                      |                    | 12:00m           | .40                  | 1.00             | :10                                    | .131            | .323             |
|                                                                                                                                                                                                                                                                                        |                      |                    | :40a             | .22                  | 1.15             | :15                                    | .077            | .332             |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  | :27                                    | .037            | .342             |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  | :35                                    | .080            | .349             |
| <u>Event of May 23, 1959</u>                                                                                                                                                                                                                                                           |                      |                    |                  |                      |                  |                                        |                 |                  |
|                                                                                                                                                                                                                                                                                        | None                 | None               | 5-23-59          | Raingage             | R-3              | 5-23-59                                |                 |                  |
|                                                                                                                                                                                                                                                                                        |                      |                    | 3:22p            | 0                    | 0                | 3:47p                                  | 0               | 0                |
|                                                                                                                                                                                                                                                                                        |                      |                    | :31              | .33                  | .17              | :50                                    | .037            | .0015            |
|                                                                                                                                                                                                                                                                                        |                      |                    | :42              | .44                  | .25              | :52                                    | .045            | .003             |
|                                                                                                                                                                                                                                                                                        |                      |                    | :47              | .60                  | .30              | :54                                    | .150            | .006             |
|                                                                                                                                                                                                                                                                                        |                      |                    | :52              | 3.00                 | .55              | :55                                    | .519            | .012             |
|                                                                                                                                                                                                                                                                                        |                      |                    | 4:27p            | .05                  | .58              | 4:00                                   | .434            | .052             |
| <u>Watershed Conditions:</u> Same as above.                                                                                                                                                                                                                                            |                      |                    |                  |                      |                  | :05                                    | .274            | .081             |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  | :10                                    | .143            | .098             |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  | :15                                    | .078            | .108             |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  | :20                                    | .052            | .113             |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  | :31                                    | .027            | .116             |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  | 5:29p                                  | 0               | .129             |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  |                                        |                 |                  |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  |                                        |                 |                  |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  |                                        |                 |                  |
|                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  |                                        |                 |                  |
| Notes: To convert runoff in in/hr. to cfs, multiply by 40.837.                                                                                                                                                                                                                         |                      |                    |                  |                      |                  |                                        |                 |                  |

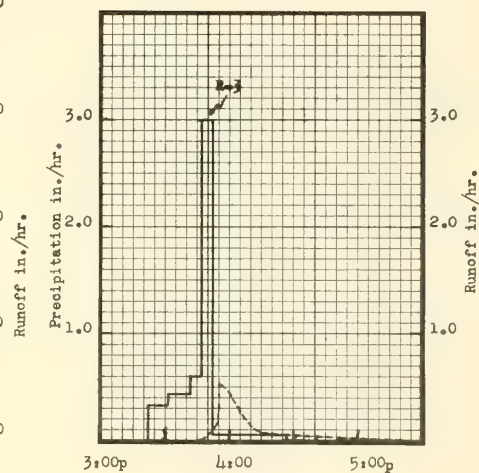




August 21-22, 1958

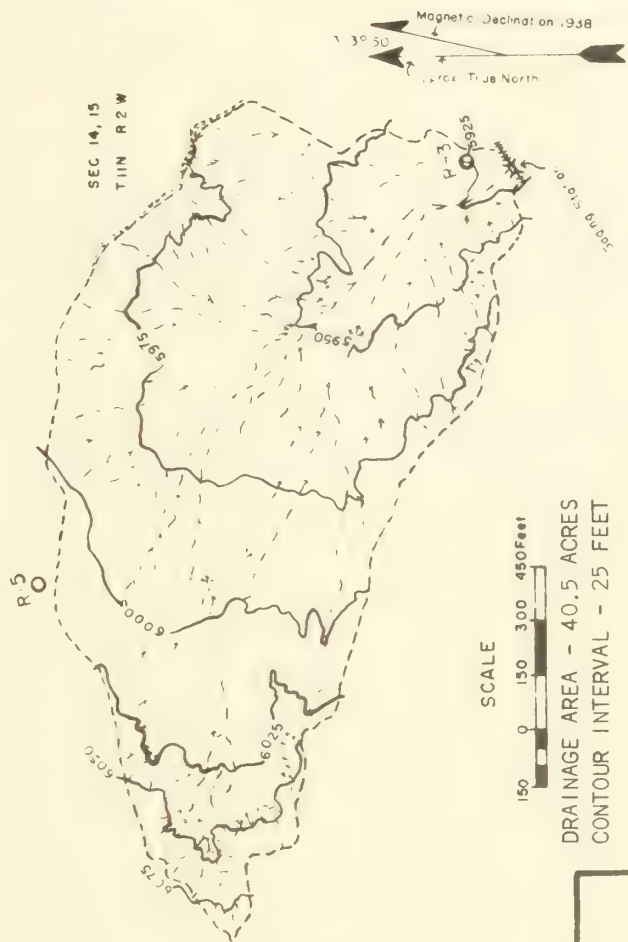


August 24, 1957



May 23, 1959

ALBUQUERQUE, NEW MEXICO WATERSHED W-II



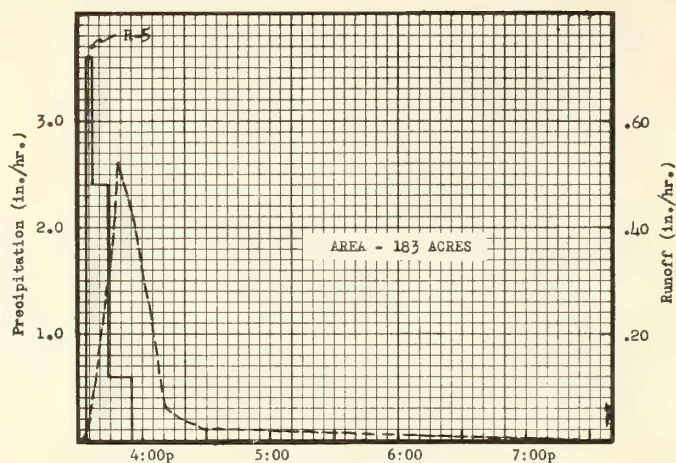
ALBUQUERQUE, NEW MEXICO  
WATERSHED W-11

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                    |                                           |                      |                  |                  |                 | Albuquerque, New Mexico Watershed W-III<br>Area - 183 or 168 acres 1/ |           |             |          |          |             |      |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|-------------------------------------------|----------------------|------------------|------------------|-----------------|-----------------------------------------------------------------------|-----------|-------------|----------|----------|-------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                                                                   | Jan.                 | Feb.               | Mar.                                      | Apr.                 | May              | June             | July            | Aug.                                                                  | Sept.     | Oct.        | Nov.     | Dec.     | Year        |      |        |      |
| 1956                                                                                                                                                                                                                                                                                                                                                                                                                                            | P 0.22<br>Q 0        | 0.14<br>0          | 0<br>0                                    | 0<br>0               | 0<br>0           | 0.38<br>0        | 0.86<br>0       | 0.81<br>.19                                                           | 0<br>0    | 0.30<br>0   | 0<br>0   | 0<br>0   | 2.71<br>.19 |      |        |      |
| 1957                                                                                                                                                                                                                                                                                                                                                                                                                                            | P .24<br>Q 1/        | .76<br>0           | 1.06<br>0                                 | .16<br>0             | .64<br>0         | .48<br>.02       | 1.23<br>.10     | 2.68<br>.09                                                           | .08<br>0  | 1.80<br>.34 | .39<br>0 | 0<br>0   | 9.52<br>.55 |      |        |      |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                            | P .86<br>Q 0         | .09<br>0           | .84<br>0                                  | .84<br>0             | .37<br>0         | .07<br>0         | 2.06<br>0       | 1.34<br>.15                                                           | 1.23<br>0 | 0<br>0      | .05<br>0 | 0<br>0   | 7.75<br>.15 |      |        |      |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                            | P 0<br>Q 0           | 0<br>0             | 0<br>0                                    | .80<br>0             | .75<br>.12       | 1.02<br>0        | .92<br>.05      | 1.66<br>.09                                                           | 0<br>0    | 1.30<br>T   | 0<br>0   | .53<br>0 | 6.98<br>.26 |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                                                      |                      |                    |                                           |                      |                  |                  |                 | Albuquerque, New Mexico Watershed W-III                               |           |             |          |          |             |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                                                                                            | MAXIMUM<br>DISCHARGE |                    | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                      |                  |                  |                 |                                                                       |           |             |          |          |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    | 1 hour                                    |                      | 2 hours          |                  | 6 hours         |                                                                       | 12 hours  |             | 1 day    |          | 2 days      |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Date                 | Rate               | Date                                      | Vol.                 | Date             | Vol.             | Date            | Vol.                                                                  | Date      | Vol.        | Date     | Vol.     | Date        | Vol. | Date   | Vol. |
| 1956                                                                                                                                                                                                                                                                                                                                                                                                                                            | 8-19                 | 0.52               | 8-19                                      | 0.19                 | 8-19             | 0.19             | 8-19            | 0.19                                                                  | 8-19      | 0.19        | 8-19     | 0.19     | 8-19        | 0.19 | 8-19   | 0.19 |
| 1957 1/                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10-19                | .20                | 10-19                                     | .13                  | 10-19            | .17              | 10-19           | .25                                                                   | 10-19     | .25         | 10-19    | .25      | 10-19       | .25  | 10-19  | .32  |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                            | 8-21                 | .14                | 8-21                                      | .09                  | 8-21             | .14              | 8-21            | .15                                                                   | 8-21      | .15         | 8-21     | .15      | 8-21        | .15  | 8-21   | .15  |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5-23                 | .09                | 5-23                                      | .07                  | 5-23             | .11              | 5-23            | .12                                                                   | 5-23      | .12         | 5-23     | .12      | 5-23        | .12  | 5-23   | .12  |
| Notes: Quality of records: monthly P and Q, excellent; Annual Max. discharges and volume, excellent. Watershed conditions: Sparsely vegetated range land; about 75% of area is bare. Vegetation consists of short grasses (blue and black grama and galleta), and shrubs (sagebrush, saltbush, and snakeweed). Vegetation is comparatively heavy in a narrow strip along the principal waterway. 1/ Area changed from 183 to 168 acres in 1957. |                      |                    |                                           |                      |                  |                  |                 |                                                                       |           |             |          |          |             |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                    |                                           |                      |                  |                  |                 | Albuquerque, New Mexico Watershed W-III<br>Area - 183 acres           |           |             |          |          |             |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                    |                                           | Rainfall             |                  |                  |                 | Runoff                                                                |           |             |          |          |             |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                            | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                          | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches)                                                      |           |             |          |          |             |      |        |      |
| Event of August 19, 1956                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |                    |                                           |                      |                  |                  |                 |                                                                       |           |             |          |          |             |      |        |      |
| 7-19-56                                                                                                                                                                                                                                                                                                                                                                                                                                         | Raingage R-5<br>0.23 | 0                  | 8-19-56<br>3:33p                          | Raingage<br>0        | R-5 1/<br>0      | 8-19-56<br>3:32p | 0               | 0                                                                     |           |             |          |          |             |      |        |      |
| 7-20                                                                                                                                                                                                                                                                                                                                                                                                                                            | .03                  | 0                  | :36                                       | 3.60                 | .18              | :35              | .0395           | .0009                                                                 |           |             |          |          |             |      |        |      |
| 7-28                                                                                                                                                                                                                                                                                                                                                                                                                                            | .06                  | 0                  | :44                                       | 2.40                 | .50              | :37              | .0652           | .0025                                                                 |           |             |          |          |             |      |        |      |
| 7-30                                                                                                                                                                                                                                                                                                                                                                                                                                            | .04                  | 0                  | :55                                       | .60                  | .60              | :39              | .1610           | .0061                                                                 |           |             |          |          |             |      |        |      |
| 7-31                                                                                                                                                                                                                                                                                                                                                                                                                                            | .14                  | 0                  |                                           |                      |                  | :43              | .2831           | .0213                                                                 |           |             |          |          |             |      |        |      |
| 8-1                                                                                                                                                                                                                                                                                                                                                                                                                                             | .28                  | 0                  |                                           |                      |                  | :45              | .3220           | .0313                                                                 |           |             |          |          |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | :49              | .5259           | .0593                                                                 |           |             |          |          |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | :55              | .4415           | .1073                                                                 |           |             |          |          |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | 4:00             | .3221           | .1383                                                                 |           |             |          |          |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | :05              | .2272           | .1603                                                                 |           |             |          |          |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | :12              | .0626           | .1763                                                                 |           |             |          |          |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | :20              | .0372           | .1823                                                                 |           |             |          |          |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | :30              | .0179           | .1873                                                                 |           |             |          |          |             |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                    |                                           |                      |                  | 7:25             | 0               | .1907                                                                 |           |             |          |          |             |      |        |      |
| Watershed Conditions:<br>See Notes above.                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                    |                                           |                      |                  |                  |                 |                                                                       |           |             |          |          |             |      |        |      |
| Notes: To convert runoff in in/hr. to cfs, multiply by 184.52.<br>1/ Runoff started earlier than R-5 precipitation, due to earlier rainfall on raingage R-4.                                                                                                                                                                                                                                                                                    |                      |                    |                                           |                      |                  |                  |                 |                                                                       |           |             |          |          |             |      |        |      |

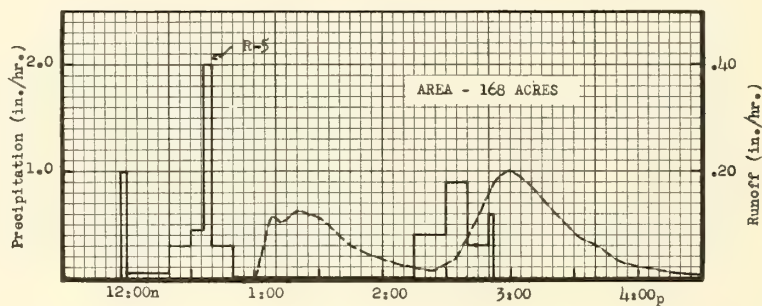
Cooperative Research Project of USDA and New Mexico Agricultural Experiment Station.

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                |                      |                    |                  |                      |                  | Albuquerque, New Mexico Watershed W-III<br>Area - 168 acres |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|-------------------------------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                 |                      |                    | Rainfall         |                      |                  | Runoff                                                      |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                  | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                                            | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of October 19, 1957                                                                                                                                                                                                                                                                                             |                      |                    |                  |                      |                  |                                                             |                 |                  |
| 10-11-57                                                                                                                                                                                                                                                                                                              | Raingage R-5<br>0.27 | 0.008              | 10-19-57         | Raingage             | R-5              | 10-19-57                                                    |                 |                  |
| 10-12                                                                                                                                                                                                                                                                                                                 | .63                  | .013               | 11:57a           | 0                    | 0                | 1:01p                                                       | 0               | 0                |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | 12:00n           | 1.00                 | .05              | :02                                                         | .0192           | .0002            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :20p             | .03                  | .06              | :03                                                         | .0384           | .0007            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :30              | .30                  | .11              | :05                                                         | .0791           | .0026            |
| Watershed Conditions: Sparsely<br>vegetated range land; about 75% of<br>area is bare. Vegetation consists<br>of short grasses (blue and black<br>grama and galleta), and shrubs<br>(sagebrush, saltbush, and snake-<br>weed). Vegetation is comparatively<br>heavy in a narrow strip along the<br>principal waterway. |                      |                    | :37              | .43                  | .16              | :08                                                         | .1080           | .0075            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :40              | 2.00                 | .26              | :12                                                         | .1003           | .0145            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :50              | .30                  | .31              | :16                                                         | .1062           | .0212            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | 2:15             | 0.                   | .31              | :20                                                         | .1227           | .0289            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :30              | .40                  | .11              | :30                                                         | .1062           | .0485            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :40              | .90                  | .50              | :40                                                         | .0743           | .0634            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :50              | .30                  | .61              | :50                                                         | .0473           | .0734            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :52              | .60                  | .63              | 2:00                                                        | .0315           | .0800            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :25                                                         | .0118           | .0882            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :35                                                         | .0334           | .0915            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :40                                                         | .0679           | .0956            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :45                                                         | .1162           | .1033            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :50                                                         | .1564           | .1146            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :53                                                         | .1835           | .1231            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :59                                                         | .2006           | .1423            |
| Event of August 21, 1958                                                                                                                                                                                                                                                                                              |                      |                    |                  |                      |                  |                                                             |                 |                  |
| 7-28-58                                                                                                                                                                                                                                                                                                               | Raingage R-5<br>0.08 | 0                  | 8-21-58          | Raingage             | R-5              | 8-21-58                                                     |                 |                  |
| 8-4                                                                                                                                                                                                                                                                                                                   | .65                  | 0                  | 8:40a            | 0                    | 0                | 10:35a                                                      | 0               | 0                |
| 8-12                                                                                                                                                                                                                                                                                                                  | .10                  | 0                  | 9:05             | .07                  | .03              | :46                                                         | .0237           | .0018            |
| 8-16                                                                                                                                                                                                                                                                                                                  | .15                  | 0                  | :30              | .24                  | .13              | :51                                                         | .0601           | .0054            |
| 8-20                                                                                                                                                                                                                                                                                                                  | .25                  | 0                  | 10:05            | .08                  | .18              | 11:00                                                       | .0407           | .0130            |
| Watershed Conditions: Same as above.                                                                                                                                                                                                                                                                                  |                      |                    | :24              | .16                  | .23              | :06                                                         | .0324           | .0167            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :30              | 1.00                 | .33              | :10                                                         | .0333           | .0189            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :35              | 2.40                 | .53              | :13                                                         | .0324           | .0206            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :40              | 1.20                 | .63              | :14                                                         | .0384           | .0211            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | 11:00            | .30                  | .73              | :15                                                         | .0755           | .0220            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :15              | .20                  | .78              | :24                                                         | .1386           | .0407            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :30              | .40                  | .88              | :27                                                         | .1339           | .0475            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | :45              | .40                  | .98              | :38                                                         | .0967           | .0685            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    | 12:20            | .34                  | 1.18             | 12:00n                                                      | .0620           | .0971            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :25p                                                        | .0384           | .1181            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | :45                                                         | .0343           | .1301            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | 1:43                                                        | .0080           | .1512            |
|                                                                                                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  | 2:05                                                        | 0               | .1528            |
| Notes: To convert runoff in in/hr. to cfs, multiply by 169,40                                                                                                                                                                                                                                                         |                      |                    |                  |                      |                  |                                                             |                 |                  |

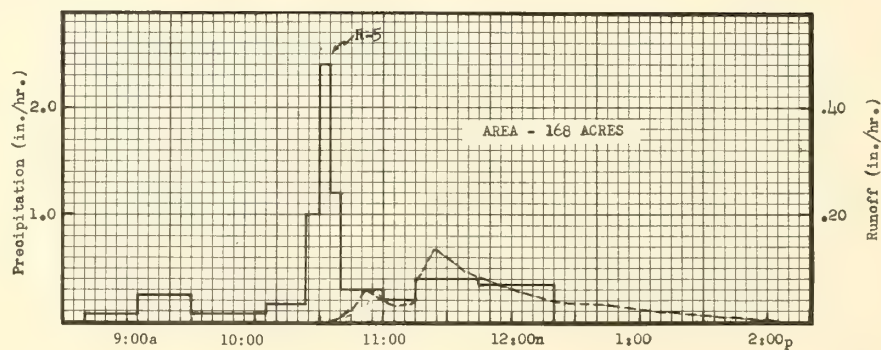




August 19, 1956

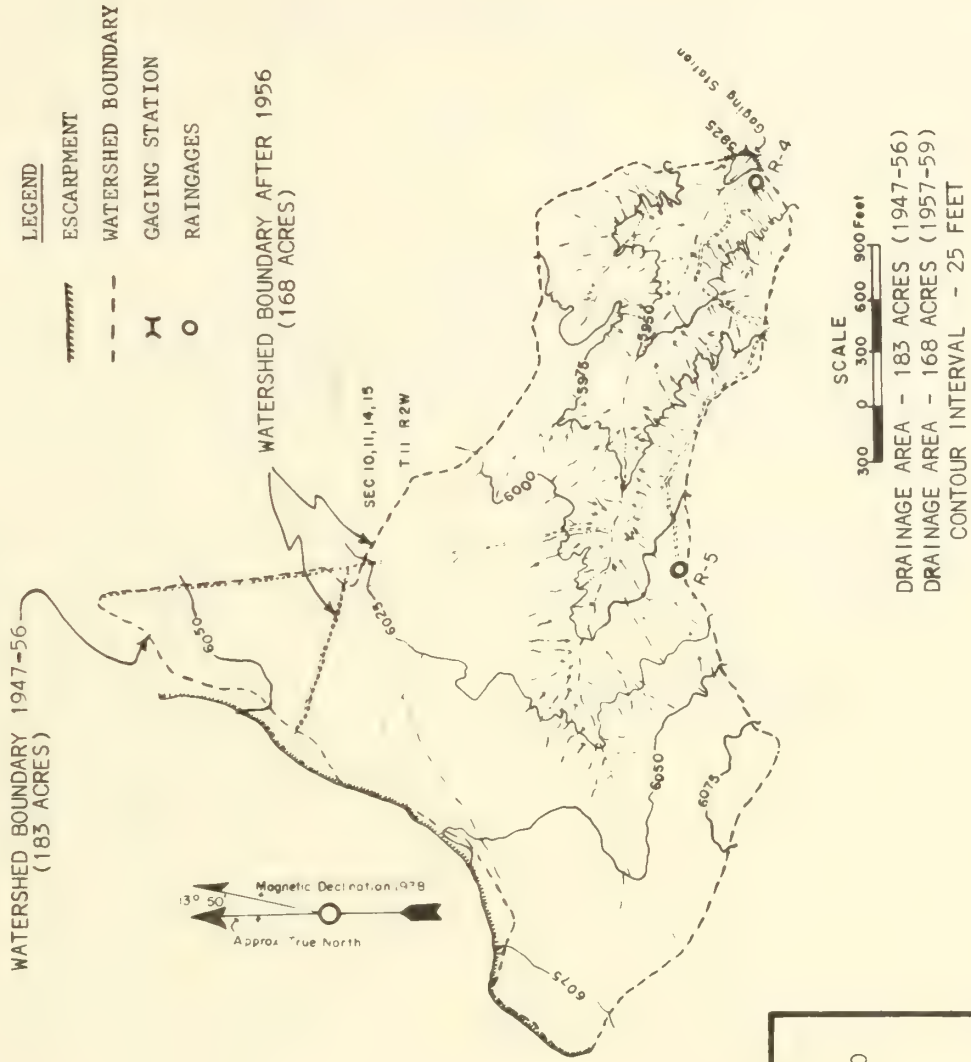


October 19, 1957



August 21, 1958

ALBUQUERQUE, NEW MEXICO WATERSHED W-III



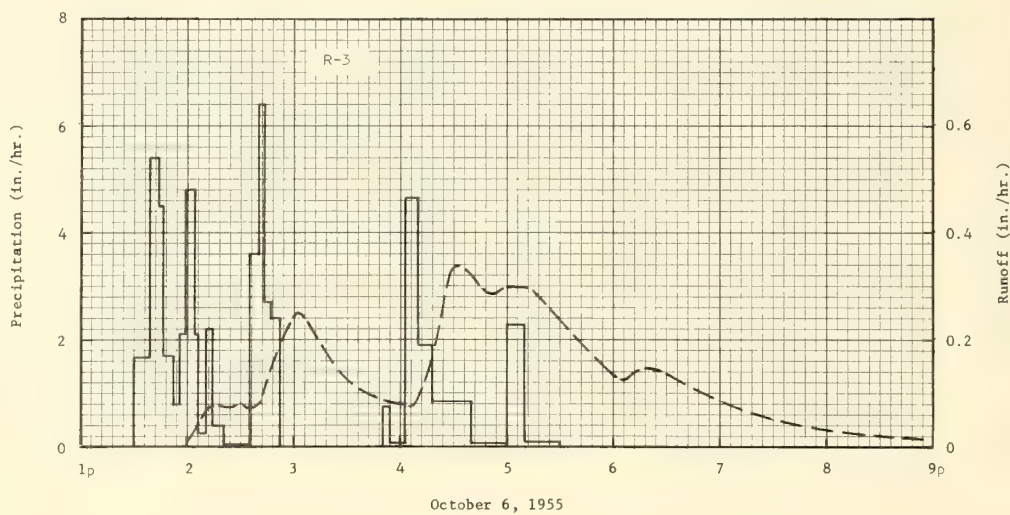
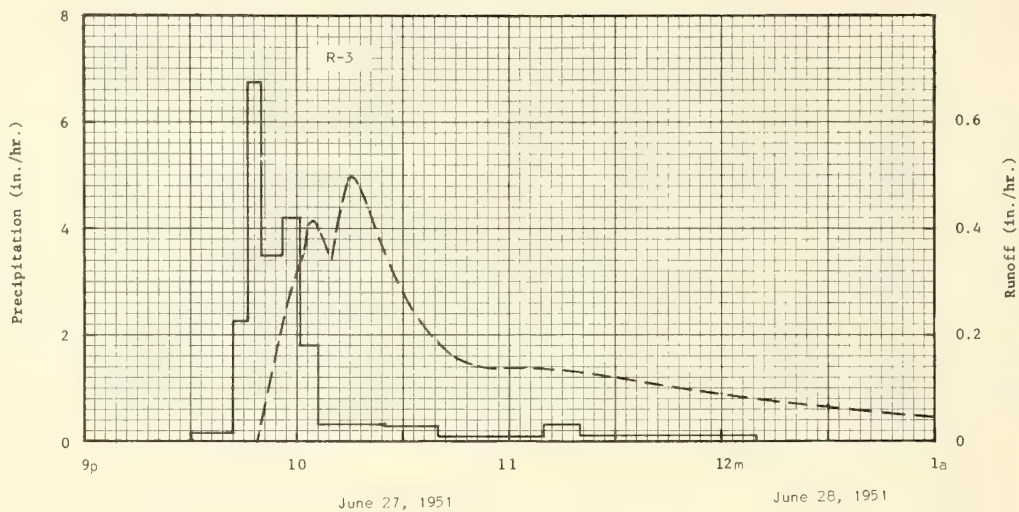
ALBUQUERQUE, NEW MEXICO  
WATERSHED W-III

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               |               |              | Monticello, Illinois Watershed IA<br>(Area - 82.0 acres) |           |           |           |           |           |               |        |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|--------------|----------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|---------------|--------|------|
| Year                                                                                                                                                                                                                                                                           | Month             | Jan.            | Feb.                                      | Mar.              | Apr.          | May           | June         | July                                                     | Aug.      | Sept.     | Oct.      | Nov.      | Dec.      | Year          |        |      |
| 1956                                                                                                                                                                                                                                                                           | P<br>Q            | 0.42<br>0       | 1.76<br>0                                 | 0.63<br>0         | 3.35<br>T     | 2.97<br>T     | 2.30<br>T    | 4.96<br>T                                                | 3.87<br>0 | 0.32<br>0 | 0.60<br>0 | 2.24<br>0 | 2.21<br>0 | 25.63<br>T    |        |      |
| 1957                                                                                                                                                                                                                                                                           | P<br>Q            | 1.49<br>0       | 1.90<br>0                                 | 1.40<br>0         | 6.73<br>e .57 | 4.40<br>T     | 7.44<br>.32  | 1.92<br>0                                                | 1.17<br>0 | 1.67<br>0 | 3.07<br>0 | 2.62<br>0 | 3.79<br>0 | 37.60<br>.89  |        |      |
| 1958                                                                                                                                                                                                                                                                           | P<br>Q            | 1.30<br>0       | e .40<br>0                                | .98<br>0          | 1.91<br>0     | 5.11<br>0     | 6.47<br>.56  | 7.27<br>.37                                              | .89<br>0  | 4.01<br>0 | .47<br>0  | 4.30<br>0 | .50<br>0  | 33.61<br>.93  |        |      |
| 1959                                                                                                                                                                                                                                                                           | P<br>Q            | 2.29<br>T       | 2.37<br>1.04                              | 3.13<br>T         | 2.77<br>0     | 3.59<br>T     | .90<br>0     | 1.27<br>0                                                | 1.35<br>0 | 3.47<br>0 | 3.56<br>0 | 2.44<br>0 | 2.02<br>0 | 29.16<br>1.04 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                        |                   |                 |                                           |                   |               |               |              | Monticello, Illinois Watershed IA                        |           |           |           |           |           |               |        |      |
| YEAR                                                                                                                                                                                                                                                                           | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |              |                                                          |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours      |                                                          | 12 hours  |           | 1 day     |           | 2 days    |               | 8 days |      |
|                                                                                                                                                                                                                                                                                | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date         | Vol.                                                     | Date      | Vol.      | Date      | Vol.      | Date      | Vol.          | Date   | Vol. |
| 1959                                                                                                                                                                                                                                                                           | 2-10              | 0.29            | 2-10                                      | 0.24              | 2-10          | 0.36          | 2-10         | 0.51                                                     | 2-10      | 0.96      | 2-10      | 1.04      | 2-10      | 1.04          | 2-10   | 1.04 |
| Notes: Monthly precipitation from one recording gage, R-1, located 300 ft. west of gaging station IB. Quality of records: Good.<br>Watershed Conditions (1956-59): Corn 12 to 38%; soybeans 10 to 52%; oats 13% (1957); clover or alfalfa-brome 7 to 52%; grass 14%; roads 3%. |                   |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |           |               |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                         |                   |                 |                                           |                   |               |               |              | Monticello, Illinois Watershed IA                        |           |           |           |           |           |               |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                          |                   |                 | Rainfall                                  |                   |               |               |              |                                                          | Runoff    |           |           |           |           |               |        |      |
| Date                                                                                                                                                                                                                                                                           | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches)                                            |           |           |           |           |           |               |        |      |
| Event of June 27, 1951                                                                                                                                                                                                                                                         |                   |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |           |               |        |      |
| 6-3-51                                                                                                                                                                                                                                                                         | 0.31              | 0               | 6-27-51                                   | Raingage          | R-3           | 6-27-51       |              |                                                          |           |           |           |           |           |               |        |      |
| 6-7                                                                                                                                                                                                                                                                            | .28               | 0               | 9:30p                                     | 0                 | 0             | 9:49p         | 0            | 0                                                        |           |           |           |           |           |               |        |      |
| 6-12                                                                                                                                                                                                                                                                           | .25               | 0               | :42                                       | .15               | .03           | :53           | .0041        | .0041                                                    |           |           |           |           |           |               |        |      |
| 6-16                                                                                                                                                                                                                                                                           | .34               | 0               | :46                                       | 2.25              | .18           | :55           | .185         | .185                                                     |           |           |           |           |           |               |        |      |
| 6-19                                                                                                                                                                                                                                                                           | .21               | 0               | :50                                       | 6.75              | .63           | :58           | .280         | .280                                                     |           |           |           |           |           |               |        |      |
| 6-23                                                                                                                                                                                                                                                                           | .11               | 0               | :56                                       | 3.50              | .98           | 10:02         | .355         | .355                                                     |           |           |           |           |           |               |        |      |
| 6-24                                                                                                                                                                                                                                                                           | .60               | 0               | 10:01                                     | 4.20              | 1.33          | :03           | .408         | .408                                                     |           |           |           |           |           |               |        |      |
| 6-25                                                                                                                                                                                                                                                                           | .07               | 0               | :06                                       | 1.80              | 1.48          | :05           | .415         | .415                                                     |           |           |           |           |           |               |        |      |
| 6-26                                                                                                                                                                                                                                                                           | .12               | 0               | :25                                       | .32               | 1.58          | :10           | .340         | .340                                                     |           |           |           |           |           |               |        |      |
| 6-27 1/                                                                                                                                                                                                                                                                        | 1.20              | T               | :40                                       | .28               | 1.65          | :12           | .424         | .424                                                     |           |           |           |           |           |               |        |      |
| Watershed Conditions                                                                                                                                                                                                                                                           |                   |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 | 11:10                                     | .08               | 1.69          | :14           | .488         | .488                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 | :20                                       | .30               | 1.74          | :16           | .496         | .496                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 | 6-28-51                                   |                   |               | :20           | .439         | .439                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 | 12:10a                                    | .11               | 1.83          | :30           | .286         | .286                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | :40           | .190         | .190                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | :50           | .139         | .289                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | 11:05         | .139         | .324                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | :20           | .127         | .357                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | :40           | .109         | .397                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | 12:00m        | .0895        | .430                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | 6-28-51       |              |                                                          |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | 1:00a         | .0473        | .498                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | 3:00          | .0092        | .545                                                     |           |           |           |           |           |               |        |      |
|                                                                                                                                                                                                                                                                                |                   |                 |                                           |                   |               | 8:45          | 0            | .558                                                     |           |           |           |           |           |               |        |      |
| Event of October 6, 1955                                                                                                                                                                                                                                                       |                   |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |           |               |        |      |
| 9-10-55                                                                                                                                                                                                                                                                        | 0.28              | 0               | 10-6-55                                   | Raingage          | R-3           | 10-6-55       |              |                                                          |           |           |           |           |           |               |        |      |
| 9-14                                                                                                                                                                                                                                                                           | .17               | 0               | 1:30p                                     | 0                 | 0             | 1:50p         | 0            | 0                                                        |           |           |           |           |           |               |        |      |
| 9-22                                                                                                                                                                                                                                                                           | .34               | 0               | :39                                       | 1.67              | .25           | :58           | .0029        | .0029                                                    |           |           |           |           |           |               |        |      |
| 9-23                                                                                                                                                                                                                                                                           | .36               | 0               | :44                                       | 5.40              | .70           | 2:06          | .0454        | .0454                                                    |           |           |           |           |           |               |        |      |
| 9-26                                                                                                                                                                                                                                                                           | .07               | 0               | :46                                       | 4.50              | .85           | :12           | .0754        | .0754                                                    |           |           |           |           |           |               |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 82.69. 1/ Prior to 10:40a.<br>For map of watershed, see page 61.1-3 of Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS-SWC, January 1960.                                             |                   |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |           |               |        |      |

Research Project 10-312, Agricultural Engineering Department, University of Illinois, in cooperation with USDA.

| SELECTED RUNOFF EVENTS                                                                                |                      |                    |                  |                      |                  | Monticello, Illinois Watershed 1A |                 |                  |
|-------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|-----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                 |                      |                    | Rainfall         |                      |                  | Runoff                            |                 |                  |
| Date                                                                                                  | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                  | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of October 6, 1955 - Continued                                                                  |                      |                    |                  |                      |                  |                                   |                 |                  |
| 9-27                                                                                                  | 0.62                 | 0                  | 1:52p            | 1.70                 | 1.02             | 2:25p                             | 0.0782          | 0.026            |
| 9-29                                                                                                  | 1.13                 | 0                  | :55              | .80                  | 1.06             | :38                               | .0782           | .043             |
| 10-4                                                                                                  | .35                  | 0                  | :59              | 2.10                 | 1.20             | :45                               | .123            | .054             |
| 10-5                                                                                                  | 1.78                 | 0                  | 2:04             | 4.80                 | 1.60             | :55                               | .214            | .083             |
| 10-6 <u>1/</u>                                                                                        | .35                  | 0                  | :06              | 2.10                 | 1.67             | 3:02                              | .249            | .110             |
| <u>Watershed Conditions</u>                                                                           |                      |                    | :11              | .24                  | 1.69             | :05                               | .243            | .123             |
| 57.7% of area was in corn, 13.6% in                                                                   |                      |                    | :14              | 2.20                 | 1.80             | :20                               | .166            | .174             |
| clover, 11.1% in meadow, 14.4% in                                                                     |                      |                    | :20              | .40                  | 1.84             | :30                               | .123            | .198             |
| grass, 3.2% in roads.                                                                                 |                      |                    | :35              | .04                  | 1.85             | :45                               | .0991           | .235             |
|                                                                                                       |                      |                    | :40              | 3.60                 | 2.15             | 4:05                              | .0754           | .264             |
|                                                                                                       |                      |                    | :43              | 6.40                 | 2.47             | :10                               | .0927           | .271             |
|                                                                                                       |                      |                    | :47              | 2.70                 | 2.65             | :25                               | .286            | .315             |
|                                                                                                       |                      |                    | :52              | 2.40                 | 2.85             | :28                               | .327            | .330             |
|                                                                                                       |                      |                    | 3:50             | 0                    | 2.85             | :33                               | .340            | .358             |
|                                                                                                       |                      |                    | :54              | .75                  | 2.90             | :50                               | .286            | .446             |
|                                                                                                       |                      |                    | 4:03             | .07                  | 2.91             | 5:00                              | .298            | .495             |
|                                                                                                       |                      |                    | :10              | 4.63                 | 3.45             | :12                               | .298            | .554             |
|                                                                                                       |                      |                    | :18              | 1.88                 | 3.70             | :30                               | .237            | .635             |
|                                                                                                       |                      |                    | e :40            | .84                  | 4.15             | 6:03                              | .127            | .733             |
|                                                                                                       |                      |                    | e 5:00           | .06                  | 4.17             | :15                               | .144            | .760             |
|                                                                                                       |                      |                    | e :10            | 2.28                 | 4.55             | :30                               | .135            | .795             |
|                                                                                                       |                      |                    | e :30p           | .09                  | 4.58             | :45                               | .109            | .826             |
|                                                                                                       |                      |                    |                  |                      |                  | 7:30                              | .0514           | .885             |
|                                                                                                       |                      |                    |                  |                      |                  | 8:30                              | .0236           | .919             |
|                                                                                                       |                      |                    |                  |                      |                  | 10:00                             | .0085           | .942             |
|                                                                                                       |                      |                    |                  |                      |                  | 10-7-55                           |                 |                  |
|                                                                                                       |                      |                    |                  |                      |                  | 1:00a                             | .0017           | .957             |
|                                                                                                       |                      |                    |                  |                      |                  | 2:30                              | 0               | .958             |
| Notes: To convert runoff in in/hr to cfs, multiply by 82.69. <u>1/</u> Prior to event beginning 1:30p |                      |                    |                  |                      |                  |                                   |                 |                  |



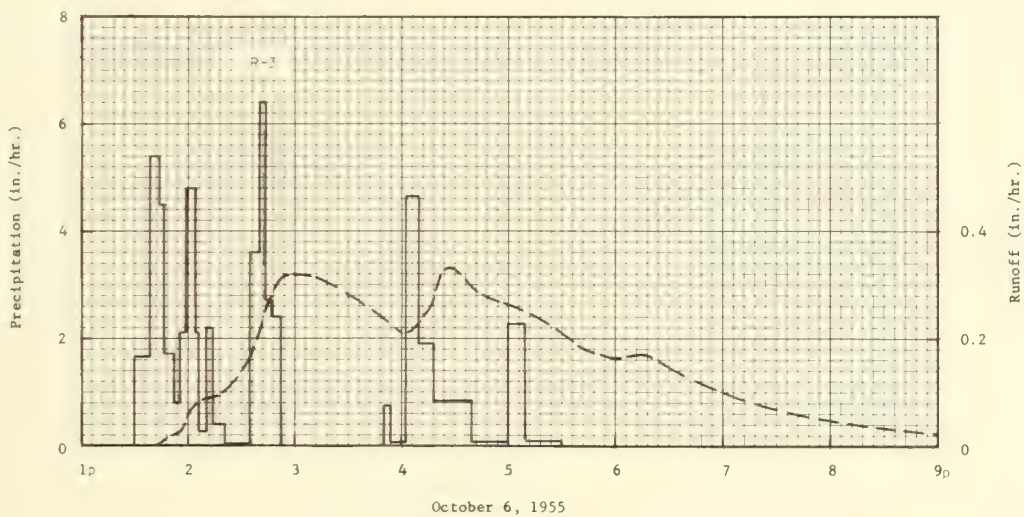
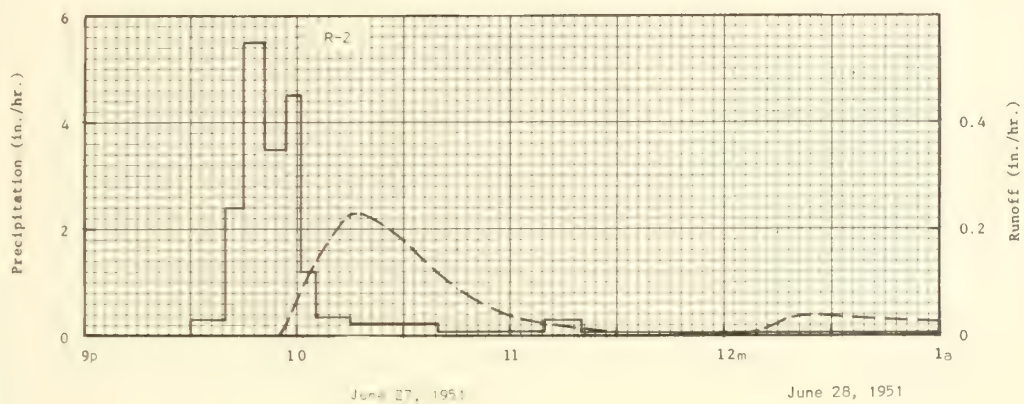


MONTICELLO, ILLINOIS WATERSHED 1A

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                    |                   |                 |                                           |                   |               |               |              | Monticello, Illinois Watershed IB<br>(Area - 45.5 acres) |           |           |           |           |                 |      |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|---------------|---------------|--------------|----------------------------------------------------------|-----------|-----------|-----------|-----------|-----------------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                | Jan.              | Feb.            | Mar.                                      | Apr.              | May           | June          | July         | Aug.                                                     | Sept.     | Oct.      | Nov.      | Dec.      | Year            |      |        |      |
| 1956<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                               | 0.42<br>0         | 1.76<br>T       | 0.63<br>0                                 | 3.35<br>.01       | 2.97<br>T     | 2.30<br>T     | 4.96<br>.01  | 3.87<br>0                                                | 0.32<br>0 | 0.60<br>0 | 2.24<br>0 | 2.21<br>0 | 25.63<br>.02    |      |        |      |
| 1957<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                               | 1.49<br>0         | 1.90<br>0       | 1.40<br>0                                 | 6.73<br>.57       | 4.40<br>0     | 7.44<br>e .37 | 1.92<br>0    | 1.17<br>0                                                | 1.67<br>0 | 3.07<br>0 | 2.62<br>0 | 3.79<br>T | 37.60<br>.94    |      |        |      |
| 1958<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                               | 1.30<br>0         | e .40<br>0      | .98<br>0                                  | 1.91<br>0         | 5.11<br>.02   | 6.47<br>.22   | 7.27<br>.40  | .89<br>0                                                 | 4.01<br>T | .47<br>0  | 4.30<br>0 | .50<br>0  | 33.61<br>.64    |      |        |      |
| 1959<br>P<br>Q                                                                                                                                                                                                                                                                                                                                                               | 2.29<br>0         | 2.37<br>e 1.04  | 3.13<br>.01                               | 2.77<br>T         | 3.59<br>T     | .90<br>0      | 1.27<br>0    | 1.35<br>0                                                | 3.47<br>0 | 3.56<br>0 | 2.44<br>0 | 2.02<br>0 | 29.16<br>e 1.05 |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                      |                   |                 |                                           |                   |               |               |              | Monticello, Illinois Watershed IB                        |           |           |           |           |                 |      |        |      |
| YEAR                                                                                                                                                                                                                                                                                                                                                                         | MAXIMUM DISCHARGE |                 | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |                   |               |               |              |                                                          |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 | 1 hour                                    |                   | 2 hours       |               | 6 hours      |                                                          | 12 hours  |           | 1 day     |           | 2 days          |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                              | Date              | Rate            | Date                                      | Vol.              | Date          | Vol.          | Date         | Vol.                                                     | Date      | Vol.      | Date      | Vol.      | Date            | Vol. | Date   | Vol. |
| 1959                                                                                                                                                                                                                                                                                                                                                                         | 1/                |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |                 |      |        |      |
| Notes: Monthly precipitation from one recording gage, R-1, located 300 ft. west of gaging station IB.<br>1/ Maximum discharge and volumes occurred 2-10-59 while recorder was being repaired. Quality of records: Good.<br>Watershed Conditions (1956-59): Corn 6 to 68%; soybeans 6 to 21%(none 1956 & 1958); oats 28% (1958); clover or alfalfa-brome 28 to 65%; grass 17. |                   |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |                 |      |        |      |
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                       |                   |                 |                                           |                   |               |               |              | Monticello, Illinois Watershed IB                        |           |           |           |           |                 |      |        |      |
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                        |                   |                 | Rainfall                                  |                   |               | Runoff        |              |                                                          |           |           |           |           |                 |      |        |      |
| Date                                                                                                                                                                                                                                                                                                                                                                         | Rainfall (inches) | Runoff (inches) | Date and time                             | Intensity (in/hr) | Acc. (inches) | Date and time | Rate (in/hr) | Acc. (inches)                                            |           |           |           |           |                 |      |        |      |
| Event of June 27, 1951                                                                                                                                                                                                                                                                                                                                                       |                   |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |                 |      |        |      |
| 6-3-51                                                                                                                                                                                                                                                                                                                                                                       | 0.30              | 0               | 6-27-51                                   | Raingage          | R-2           | 6-27-51       |              |                                                          |           |           |           |           |                 |      |        |      |
| 6-7                                                                                                                                                                                                                                                                                                                                                                          | .34               | 0               | 9:30p                                     | 0                 | 0             | 9:50p         | 0            | 0                                                        |           |           |           |           |                 |      |        |      |
| 6-12                                                                                                                                                                                                                                                                                                                                                                         | .22               | 0               | :40                                       | .30               | .05           | :55           | .0022        | 0                                                        |           |           |           |           |                 |      |        |      |
| 6-16                                                                                                                                                                                                                                                                                                                                                                         | .28               | 0               | :45                                       | 2.40              | .25           | 10:00         | .0621        | .002                                                     |           |           |           |           |                 |      |        |      |
| 6-19                                                                                                                                                                                                                                                                                                                                                                         | .25               | 0               | :51                                       | 5.50              | .80           | :06           | .146         | .014                                                     |           |           |           |           |                 |      |        |      |
| 6-23                                                                                                                                                                                                                                                                                                                                                                         | .10               | 0               | :57                                       | 3.50              | 1.15          | :15           | .222         | .042                                                     |           |           |           |           |                 |      |        |      |
| 6-24                                                                                                                                                                                                                                                                                                                                                                         | .56               | 0               | 10:01                                     | 4.50              | 1.45          | :18           | .229         | .053                                                     |           |           |           |           |                 |      |        |      |
| 6-25                                                                                                                                                                                                                                                                                                                                                                         | .08               | 0               | :05                                       | 1.20              | 1.53          | :25           | .203         | .078                                                     |           |           |           |           |                 |      |        |      |
| 6-26                                                                                                                                                                                                                                                                                                                                                                         | .12               | 0               | :15                                       | .36               | 1.59          | :35           | .141         | .107                                                     |           |           |           |           |                 |      |        |      |
| 6-27 1/                                                                                                                                                                                                                                                                                                                                                                      | 1.16              | 0               | :40                                       | .22               | 1.68          | :45           | .0890        | .126                                                     |           |           |           |           |                 |      |        |      |
| Watershed Conditions                                                                                                                                                                                                                                                                                                                                                         |                   |                 | 11:10                                     | .06               | 1.71          | 11:05         | .0286        | .144                                                     |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 | :20                                       | .30               | 1.76          | :30           | .0083        | .151                                                     |           |           |           |           |                 |      |        |      |
| 72.8% of area was in meadow, 21.4% in wheat, and 5.8% in corn.                                                                                                                                                                                                                                                                                                               |                   |                 | 6-28-51                                   |                   |               | 6-28-51       |              |                                                          |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 | 12:10a                                    | .07               | 1.82          | 12:09a        | .0019        | .154                                                     |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 | 1:00                                      | .05               | 1.86          | :12           | .0153        | .154                                                     |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |               | :17           | .0320        | .156                                                     |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |               | :20           | .0360        | .158                                                     |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |               | :28           | .0381        | .163                                                     |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |               | 1:00          | .0268        | .180                                                     |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |               | :30           | .0153        | .191                                                     |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |               | 3:00          | .0036        | .204                                                     |           |           |           |           |                 |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                              |                   |                 |                                           |                   |               | 7:00a         | 0            | .207                                                     |           |           |           |           |                 |      |        |      |
| Event of October 6, 1955                                                                                                                                                                                                                                                                                                                                                     |                   |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |                 |      |        |      |
| 9-10-55                                                                                                                                                                                                                                                                                                                                                                      | 0.28              | 0               | 10-6-55                                   | Raingage          | R-3           | 10-6-55       |              |                                                          |           |           |           |           |                 |      |        |      |
| 9-14                                                                                                                                                                                                                                                                                                                                                                         | .17               | 0               | 1:30p                                     | 0                 | 0             | 1:42p         | 0            | 0                                                        |           |           |           |           |                 |      |        |      |
| 9-22                                                                                                                                                                                                                                                                                                                                                                         | .34               | 0               | :39                                       | 1.67              | .25           | :48           | .0166        | .001                                                     |           |           |           |           |                 |      |        |      |
| 9-23                                                                                                                                                                                                                                                                                                                                                                         | .36               | 0               | :44                                       | 5.40              | .70           | :57           | .0338        | .004                                                     |           |           |           |           |                 |      |        |      |
| 9-26                                                                                                                                                                                                                                                                                                                                                                         | .07               | 0               | :46                                       | 4.50              | .85           | 2:03          | .0752        | .010                                                     |           |           |           |           |                 |      |        |      |
| Notes: To convert runoff in in/hr to cfs, multiply by 45.88. 1/ Prior to 11:00a.<br>For map of watershed, see 61.1-7 of Selected Runoff Events for Small Agricultural Watersheds in the United States, ARS-SWC, January 1960.                                                                                                                                                |                   |                 |                                           |                   |               |               |              |                                                          |           |           |           |           |                 |      |        |      |

Research Project 10-312, Agricultural Engineering Department, University of Illinois, in cooperation with USDA.

| SELECTED RUNOFF EVENTS                                                                                 |                      |                    |                                      |                      |                  | Monticello, Illinois Watershed IB |                 |                  |
|--------------------------------------------------------------------------------------------------------|----------------------|--------------------|--------------------------------------|----------------------|------------------|-----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                  |                      |                    | Rainfall                             |                      |                  | Runoff                            |                 |                  |
| Date                                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                  | Rate<br>(in/hr) | Acc.<br>(inches) |
|                                                                                                        |                      |                    | Event of October 6, 1955 - Continued |                      |                  |                                   |                 |                  |
| 9-27                                                                                                   | .62                  | 0                  | 1:52p                                | 1.70                 | 1.02             | 2:06p                             | 0.0818          | 0.014            |
| 9-29                                                                                                   | 1.13                 | 0                  | :55                                  | .80                  | 1.06             | :18                               | .0926           | .031             |
| 10-4                                                                                                   | .35                  | 0                  | :59                                  | 2.10                 | 1.20             | :30                               | .141            | .054             |
| 10-5                                                                                                   | 1.78                 | 0                  | 2:04                                 | 4.80                 | 1.60             | :36                               | .173            | .070             |
| 10-6 <u>1/</u>                                                                                         | .35                  | 0                  | :06                                  | 2.10                 | 1.67             | :48                               | .286            | .116             |
| <u>Watershed Conditions</u>                                                                            |                      |                    | :11                                  | .24                  | 1.69             | :51                               | .305            | .131             |
| 72.8% of area was in meadow, 21.4%<br>in clover, and 5.8% in corn.                                     |                      |                    | :14                                  | 2.20                 | 1.80             | :54                               | .319            | .147             |
|                                                                                                        |                      |                    | :20                                  | .40                  | 1.84             | 3:00                              | .319            | .179             |
|                                                                                                        |                      |                    | :35                                  | .04                  | 1.85             | :30                               | .279            | .331             |
|                                                                                                        |                      |                    | :40                                  | 3.60                 | 2.15             | :45                               | .249            | .397             |
|                                                                                                        |                      |                    | :43                                  | 6.40                 | 2.47             | 4:03                              | .209            | .465             |
|                                                                                                        |                      |                    | :47                                  | 2.70                 | 2.65             | :18                               | .271            | .523             |
|                                                                                                        |                      |                    | :52                                  | 2.40                 | 2.85             | :24                               | .327            | .554             |
|                                                                                                        |                      |                    | 3:50                                 | 0                    | 2.85             | :30                               | .327            | .586             |
|                                                                                                        |                      |                    | :54                                  | .75                  | 2.90             | :40                               | .294            | .638             |
|                                                                                                        |                      |                    | 4:03                                 | .07                  | 2.91             | 5:00                              | .264            | .731             |
|                                                                                                        |                      |                    | :10                                  | 4.63                 | 3.45             | :30                               | .209            | .851             |
|                                                                                                        |                      |                    | :18                                  | 1.88                 | 3.70             | 6:00                              | .162            | .942             |
|                                                                                                        |                      |                    | e :40                                | .84                  | 4.15             | :10                               | .168            | .970             |
|                                                                                                        |                      |                    | e 5:00                               | .06                  | 4.17             | 7:00                              | .100            | 1.082            |
|                                                                                                        |                      |                    | e :10                                | 2.28                 | 4.55             | 8:00                              | .0490           | 1.155            |
|                                                                                                        |                      |                    | e :30p                               | .09                  | 4.58             | 9:00                              | .0218           | 1.189            |
|                                                                                                        |                      |                    |                                      |                      |                  | 10-7-55                           |                 |                  |
|                                                                                                        |                      |                    |                                      |                      |                  | 1:00a                             | 0               | 1.211            |
| Notes: To convert runoff in in/hr to cfs, multiply by 45.88. <u>1/</u> Prior to event beginning 1:30p. |                      |                    |                                      |                      |                  |                                   |                 |                  |



MONTICELLO, ILLINOIS WATERSHED 1B



OXFORD, MISSISSIPPI Watershed W-4

**LOCATION:** Marshall Co., Miss.; 4.8 mi. SW of Holly Springs, on State Highway No. 4; Chews Creek, Pigeon Roost Creek Watershed, Yazoo River Basin.

**AREA:** 2,000 ac. (3.13 sq. mi.)

**SHAPE:** Rectangular; 2.4 mi. long, 1.3 mi. wide.

**SLOPES:** 13% is in 0-2% class; 18% in 2-5%; 11% in 5-8%; 5% in 8-12%; 12% in 12-17%; 41% in 17% and above. Aspect N.

**SOILS:** Loessial and Coastal Plains; topsoil - 5% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 8% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 15% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 59% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 13% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 5% moderate to moderately slow permeability, **impeding** layer at approximately 30 ins.; 8% slow permeability, **impeding** layer at 15 to 20 ins.; 15% moderate to slow permeability, **impeding** layer at 15 to 20 ins.; 59% moderate to rapid permeability, no **impeding** layer; 13% moderate to moderately rapid permeability, no **impeding** layer. Internal drainage - medium to slow. Loring silt loam - 5%; Grenada silt loam - 8%; Providence silt loam and silty clay loam - 13%; Ruston fine sandy loam - 59%; Hymon loam - 13%.

**EROSION:** + - 13%; 2 - 22%; 3 - 65%.

**LAND CAPABILITY:** II - 14%, III - 6%; IV - 6%; VI - 15%; VII - 59%.

**SURFACE DRAINAGE:** Good; length of principal channel - 2.25 mi.; sand bed channel. Approximately 26% non-contributing area due to small desilting and retarding dams, increased to about 28% in 1960.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff - current meter rated section of natural sand-bottom channel; continuous water-stage recorder. Precipitation - two recording gages, increased to three recording gages, July, 1959.

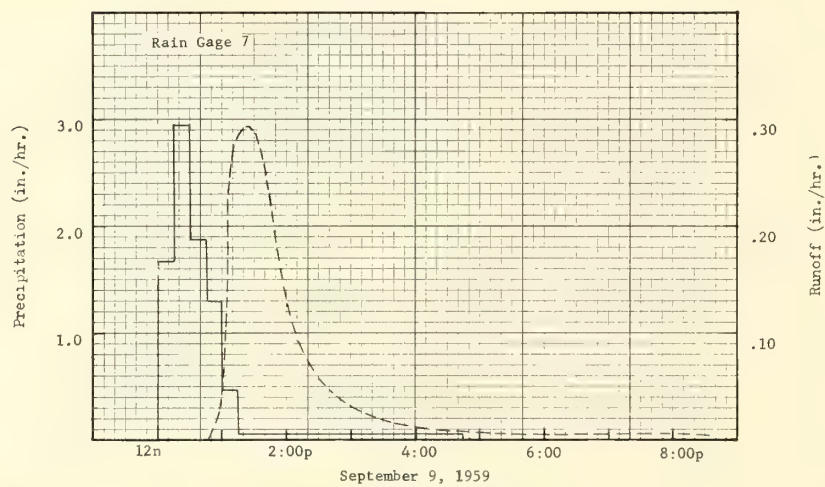
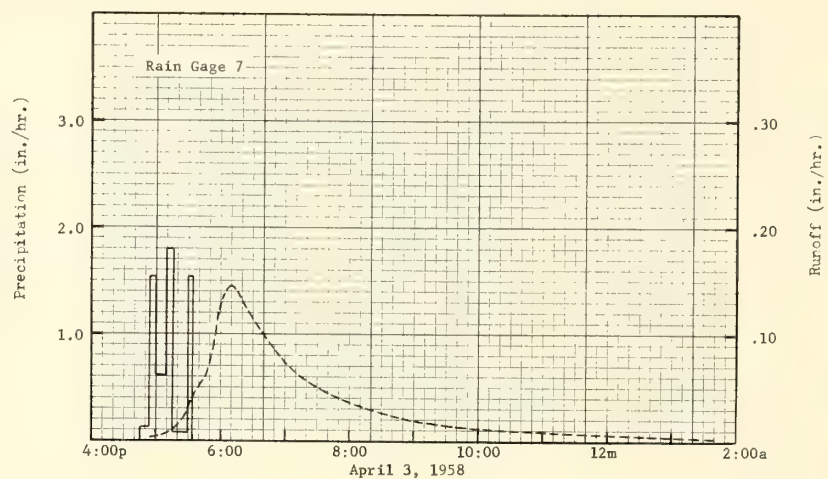
**WATERSHED CONDITIONS:** Normally about 22% is in cultivation - cotton and corn, 32% idle - good to poor cover of broom sedge and common grasses, 10% pasture - fair to poor cover; 3% planted to pine seedlings - fair to poor cover; 31% forest - good to fair cover; 2% bare gullies of which 1% is above gully plugs.

**GENERALLY REPRESENTS:** Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                   |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-4<br>(Area - 2,000 acres) |          |       |       |      |        |       |        |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|-----------------------------------------------------------|----------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                               |                   | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July                                                      | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                                        | P                 | 8.10 | 6.72                                      | 2.47 | 6.56    | 5.33 | 5.26    | 3.84                                                      | 1.47     | 5.76  | 3.68  | 9.40 | 4.46   | 63.05 |        |      |
|                                                                                                                                                                             | Q                 | 3.26 | 1.49                                      | .08  | 1.44    | .71  | .23     | .20                                                       | .02      | .29   | .04   | 2.45 | .58    | 10.79 |        |      |
| 1958                                                                                                                                                                        | P                 | 2.59 | 1.54                                      | 3.65 | 7.02    | 3.46 | 5.52    | 7.86                                                      | .95      | 9.89  | 1.01  | 3.47 | 1.62   | 48.58 |        |      |
|                                                                                                                                                                             | Q                 | .07  | .01                                       | .06  | .74     | .46  | .03     | .63                                                       | 0        | .98   | 0     | .10  | T      | 3.08  |        |      |
| 1959                                                                                                                                                                        | P                 | 3.75 | 3.89                                      | 3.11 | 3.50    | 4.80 | 4.72    | 3.68                                                      | 4.63     | 3.96  | 2.29  | 3.59 | 6.88   | 48.80 |        |      |
|                                                                                                                                                                             | Q                 | .30  | .82                                       | .07  | .09     | .25  | .41     |                                                           | .29      | .38   | .02   | .04  | 1.06   | 3.77  |        |      |
| Normal P                                                                                                                                                                    |                   | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17                                                      | 3.13     | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                     |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-4                         |          |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                                        | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                                           |          |       |       |      |        |       |        |      |
|                                                                                                                                                                             |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                                           | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                             | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                                                      | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                                        | 11-13             | 0.56 | 11-13                                     | 0.53 | 11-13   | 0.89 | 11-13   | 1.40                                                      | 11-13    | 1.58  | 1-31  | 2.38 | 1-30   | 3.34  | 1-27   | 3.90 |
| 1958                                                                                                                                                                        | 7-22              | .37  | 7-22                                      | .24  | 7-22    | .33  | 7-22    | .37                                                       | 9-20     | .48   | 9-19  | .76  | 9-19   | .87   | 9-17   | .89  |
| 1959                                                                                                                                                                        | 9-9               | .29  | 9-9                                       | .24  | 9-9     | .31  | 12-18   | .45                                                       | 12-18    | .49   | 12-18 | .50  | 12-17  | .70   | 12-11  | 1.00 |
| Notes: Quality of records: Q - fair in 1957, good in 1958, fair in 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Mississippi. |                   |      |                                           |      |         |      |         |                                                           |          |       |       |      |        |       |        |      |

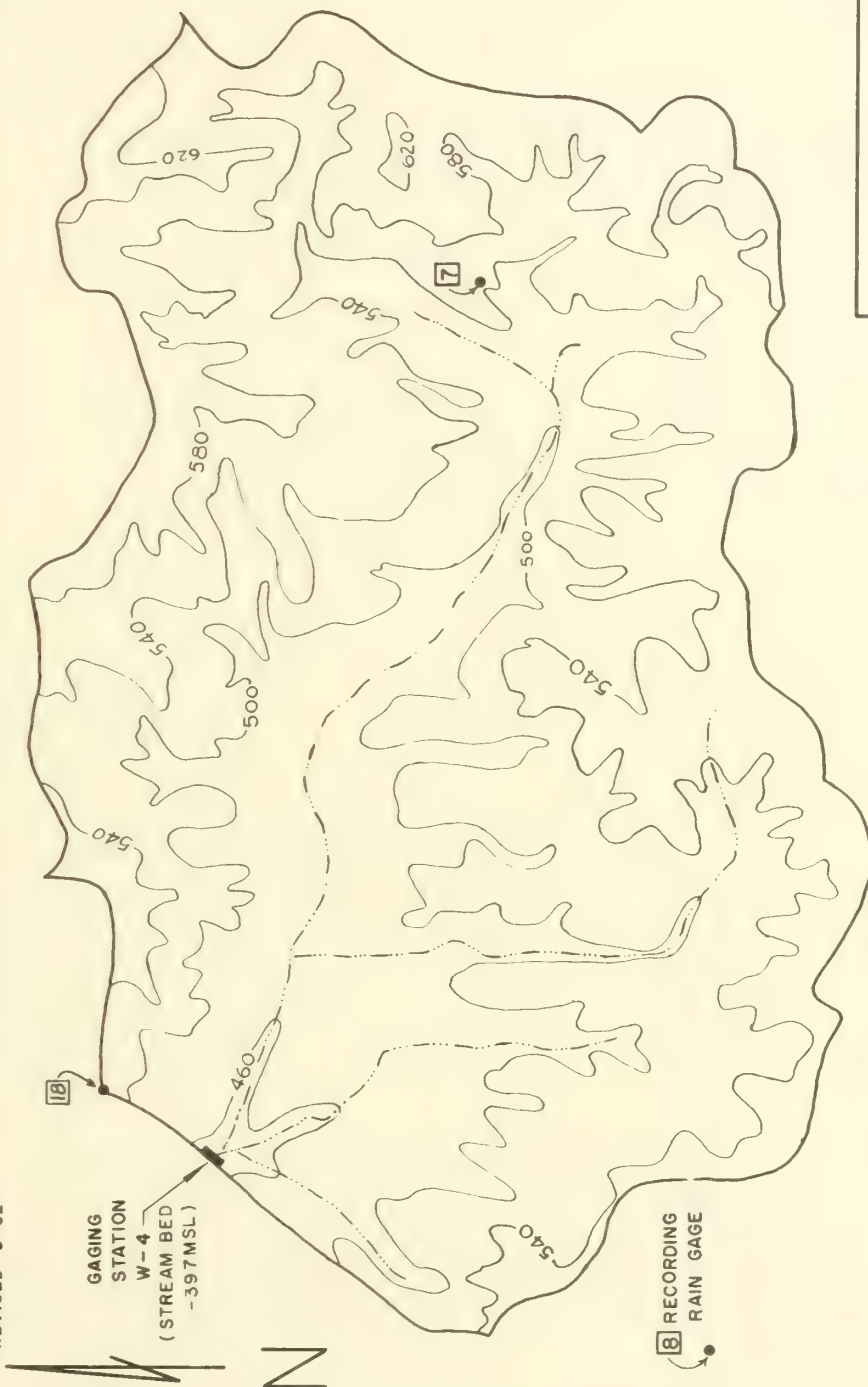
Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                     |                                    |                     |                  |                                       |                  | Oxford, Mississippi Watershed W-4 |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------|------------------|---------------------------------------|------------------|-----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                      |                                    |                     | Rainfall         |                                       |                  | Runoff                            |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                       | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches)  | Date and<br>time | Intensity<br>(in/hr)                  | Acc.<br>(inches) | Date and<br>time                  | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of April 3, 1958                                                                                                                                                                                                                                                                                                                                                                                                                     |                                    |                     |                  |                                       |                  |                                   |                 |                  |
| 3-4-58                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0                                  | 0                   | 4-3-58           | Rain Gage 7                           |                  | 4-3-58                            |                 |                  |
| 3-5                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                                  | 0                   | 4:45p            | 0                                     | 0                | 4:55p                             | .0036           | 0                |
| 3-6                                                                                                                                                                                                                                                                                                                                                                                                                                        | .04                                | 0                   | :55              | .12                                   | .02              | 5:20                              | .0114           | .0031            |
| 3-7                                                                                                                                                                                                                                                                                                                                                                                                                                        | .64                                | .0036               | 5:00             | 1.56                                  | .15              | :30                               | .0332           | .0068            |
| 3-8                                                                                                                                                                                                                                                                                                                                                                                                                                        | .42                                | .0048               | :10              | .60                                   | .25              | :45                               | .0570           | .0181            |
| 3-9                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0036               | :15              | 1.80                                  | .40              | 6:00                              | .1314           | .0417            |
| 3-10-11                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                                  | 0                   | :30              | .08                                   | .42              | :10                               | .1453           | .0648            |
| 3-12                                                                                                                                                                                                                                                                                                                                                                                                                                       | .08                                | 0                   | :35              | 1.56                                  | .55              | :30                               | .1116           | .1088            |
| 3-13                                                                                                                                                                                                                                                                                                                                                                                                                                       | .07                                | 0                   |                  |                                       |                  | 7:00                              | .0719           | .1538            |
| 3-14-16                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                                  | 0                   |                  |                                       |                  | 8:00                              | .0372           | .2068            |
| 3-17                                                                                                                                                                                                                                                                                                                                                                                                                                       | .61                                | .0048               | 4-3-58           | Rain Gage 8                           |                  | 9:00                              | .0193           | .2343            |
| 3-18-21                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                                  | 0                   | 4:40p            | 0                                     | 0                | 12:00m                            | .0050           | .2643            |
| 3-22                                                                                                                                                                                                                                                                                                                                                                                                                                       | .03                                | 0                   | :50              | 1.36                                  | .04              | 4-4-59                            |                 |                  |
| 3-23                                                                                                                                                                                                                                                                                                                                                                                                                                       | .98                                | .0167               | 5:00             | 1.44                                  | .28              | 12:00n                            | .0067           | .2991            |
| 3-24                                                                                                                                                                                                                                                                                                                                                                                                                                       | .04                                | .0119               | :10              | 1.80                                  | .58              | 12:00m                            | .0004           | .3051            |
| 3-25                                                                                                                                                                                                                                                                                                                                                                                                                                       | .25                                | 0                   | :25              | .08                                   | .60              |                                   |                 |                  |
| 3-26                                                                                                                                                                                                                                                                                                                                                                                                                                       | .27                                | .0167               | :30              | .96                                   | .68              |                                   |                 |                  |
| 3-27                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                                  | .0024               |                  |                                       |                  |                                   |                 |                  |
| 3-28                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                                  | 0                   |                  |                                       |                  |                                   |                 |                  |
| 3-29                                                                                                                                                                                                                                                                                                                                                                                                                                       | .05                                | 0                   |                  |                                       |                  |                                   |                 |                  |
| 3-30                                                                                                                                                                                                                                                                                                                                                                                                                                       | .08                                | 0                   |                  |                                       |                  |                                   |                 |                  |
| 3-31                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                                  | 0                   |                  |                                       |                  |                                   |                 |                  |
| 4-1-58                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0                                  | 0                   |                  |                                       |                  |                                   |                 |                  |
| 4-2                                                                                                                                                                                                                                                                                                                                                                                                                                        | .06                                | 0                   |                  |                                       |                  |                                   |                 |                  |
| 4-3                                                                                                                                                                                                                                                                                                                                                                                                                                        | .98                                | .0977 <sup>2/</sup> |                  |                                       |                  |                                   |                 |                  |
| Watershed Conditions: 21% of area<br>tilled for planting of row crops;<br>11% pasture, 2% hay, 33% idle,<br>31% woods - fair to good cover;<br>2% bare gullies.                                                                                                                                                                                                                                                                            |                                    |                     |                  |                                       |                  |                                   |                 |                  |
| Event of September 9, 1959                                                                                                                                                                                                                                                                                                                                                                                                                 |                                    |                     |                  |                                       |                  |                                   |                 |                  |
| 8-7-59                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0                                  | 0                   | 9-9-59           | Rain Gage 7                           |                  | 9-9-59                            |                 |                  |
| 8-8-12                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0                                  | 0                   | 12:00n           | 0                                     | 0                | 12:45p                            | 0               | 0                |
| 8-13                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.05                               | 0                   | :08p             | 1.35                                  | .18              | :55                               | .0250           | .0029            |
| 8-14                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                                  | 0                   | :13              | 4.44                                  | .55              | 1:00                              | .0850           | .0075            |
| 8-15                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                                  | 0                   | :15              | .90                                   | .58              | :05                               | .2350           | .0208            |
| 8-16                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.10                               | 0                   | :27              | 3.85                                  | 1.35             | :15                               | .2860           | .0642            |
| 8-17                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                                  | 0                   | :40              | 2.76                                  | 1.95             | :28                               | .2910           | .1267            |
| 8-18                                                                                                                                                                                                                                                                                                                                                                                                                                       | .84                                | 0                   | 1:00             | 1.35                                  | 2.40             | :45                               | .2342           | .2018            |
| 8-19                                                                                                                                                                                                                                                                                                                                                                                                                                       | .01                                | 0                   | :07              | 3.43                                  | 2.80             | 2:00                              | .1392           | .2484            |
| 8-20                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                                  | 0                   | :13              | .60                                   | 2.85             | :15                               | .0771           | .2749            |
| 8-21                                                                                                                                                                                                                                                                                                                                                                                                                                       | .28                                | 0                   | :17              | 1.20                                  | 2.95             | :30                               | .0542           | .2913            |
| 8-22                                                                                                                                                                                                                                                                                                                                                                                                                                       | .03                                | 0                   | 2:50             | .04                                   | 3.01             | 3:00                              | .0337           | .3128            |
| 8-23                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                                  | 0                   | 4:45             | .02                                   | 3.06             | 4:00                              | .0128           | .3340            |
| 8-24                                                                                                                                                                                                                                                                                                                                                                                                                                       | .61                                | 0.0012              |                  |                                       |                  | 6:00                              | .0048           | .3482            |
| 8-25                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.04                               | .2851               |                  |                                       |                  | 9:00                              | .0021           | .3606            |
| 8-26-29                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                                  | 0                   | 9-9-59           | Rain Gages 7, 8, and 18 <sup>3/</sup> |                  | 12:00m                            | .0007           | .3648            |
| 8-30                                                                                                                                                                                                                                                                                                                                                                                                                                       | .49                                | 0                   | 12:00n           | 0                                     | 0                | 9-10-59                           |                 |                  |
| 8-31                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                                  | 0                   | :15 p            | 1.68                                  | .42              | 3:00a                             | .0004           | .3664            |
| 9-1                                                                                                                                                                                                                                                                                                                                                                                                                                        | .10                                | 0                   | :30              | 2.96                                  | 1.16             | 6:00                              | .0002           | .3673            |
| 9-2-3                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0                                  | 0                   | :45              | 1.88                                  | 1.63             | 7:00                              | 0               | .3674            |
| 9-4                                                                                                                                                                                                                                                                                                                                                                                                                                        | .07                                | 0                   | 1:00             | 1.28                                  | 1.95             |                                   |                 |                  |
| 9-5                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.10                               | .0202               | :15              | .44                                   | 2.06             |                                   |                 |                  |
| 9-6-8                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0                                  | 0                   | 4:45             | .03                                   | 2.15             |                                   |                 |                  |
| Watershed Conditions: 21% of area<br>in matured cotton and corn - good<br>to fair cover; 11% pasture, 2%<br>hay, 33% idle, 31% woods - good<br>cover; 2% bare gullies.                                                                                                                                                                                                                                                                     |                                    |                     |                  |                                       |                  |                                   |                 |                  |
| <b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 2016.7. For an additional selected event see "Selected<br>Runoff Events for Small Agricultural Watersheds," ARS-SWC, January 1960, page 62.1-1.<br><sup>1/</sup> Rain gages 7 and 8 for event of April 3, 1958, and rain gages 7, 8, and 18 for event of September 9,<br>1959, Thiessen weighted.<br><sup>2/</sup> Runoff 9:30a to 4:55p.<br><sup>3/</sup> Thiessen weighted. |                                    |                     |                  |                                       |                  |                                   |                 |                  |



OXFORD, MISSISSIPPI WATERSHED W-4

REVISED 5-62



OXFORD, MISSISSIPPI  
WATERSHED W-4  
AREA: 2000 ACRES

NOTE: FOR WATERSHED LOCATION  
SEE FIGURE 1, PAGE 62.II-5

SCALE IN MILES

CONTOUR INTERVAL - 40 FEET



OXFORD, MISSISSIPPI Watershed W-5

LOCATION: Marshall Co., Miss.; 6.1 mi. SW of Holly Springs, on State Highway No. 4; Willie Wilkins Creek, Pigeon Roost Creek Watershed, Yazoo River Basin.

AREA: 1,130 ac. (1.76 sq. mi.)

SHAPE: Square; 1.5 mi. wide, 1.2 mi. long.

SLOPES: 7% is in 0-2% class; 43% in 2-5%; 17% in 5-8%; 6% in 8-12%; 6% in 12-17%; 21% in 17% and above. Aspect NW.

SOILS: Loessial and Coastal Plains; topsoil - 8% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 12% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 15% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 58% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 7% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 8% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 12% slow permeability, impeding layer at 15 to 20 ins.; 15% moderate to slow permeability, impeding layer at 15 to 20 ins.; 58% moderate to rapid permeability, no impeding layer; 7% moderate to moderately rapid permeability, no impeding layer. Internal drainage - medium to slow. Loring silt loam - 8%; Grenada silt loam - 12%; Providence silt loam and silty clay loam - 15%; Ruston fine sandy loam - 58%; Hymon loam - 7%.

EROSION: + - 7%; 1 - 8%; 2 - 48%; 3 - 37%.

LAND CAPABILITY: II - 12%, III - 6%; IV - 6%; VI - 16%; VII - 60%.

SURFACE DRAINAGE: Good; length of principal waterway - 1.5 mi.; sand bed channel. About 10% non-contributing area due to small silting and retention dams, increased to 19% in August, 1961.

CHARACTER OF FLOW: Spring-fed intermittent, continuous.

INSTRUMENTATION: Runoff - current meter rated section of natural sand-bottom channel; continuous water-stage recorder. Precipitation - one recording gage in watershed.

WATERSHED CONDITIONS: Normally about 26% is in cultivation - cotton and corn, 21% idle - good to poor cover of broom sedge and common grasses, 30% pasture - fair to poor cover; 21% woods - good to fair cover; 2% bare gullies.

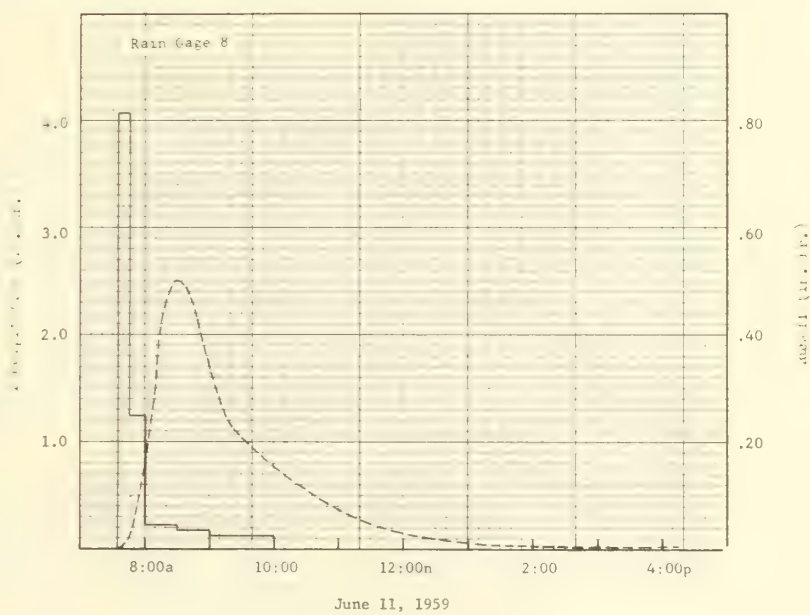
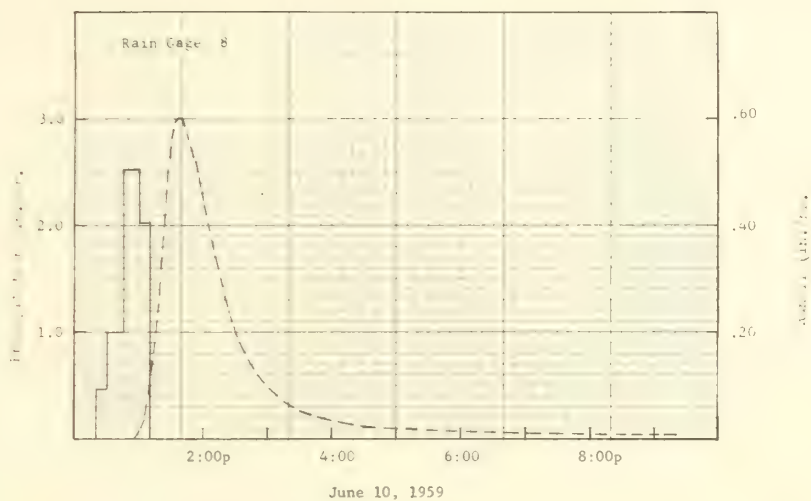
GENERALLY REPRESENTS: Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                            |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-5<br>(Area - 1,130 Acres) |          |       |       |      |        |       |        |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|-----------------------------------------------------------|----------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                        |                   | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July                                                      | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                                 | P                 | 8.70 | 6.02                                      | 2.47 | 7.05    | 5.81 | 6.18    | 3.47                                                      | 1.66     | 6.00  | 3.54  | 9.39 | 4.38   | 64.67 |        |      |
|                                                                                                                                                                      | Q                 | 5.01 | 1.96                                      | .20  | 2.28    | 1.08 | .81     | .24                                                       | .02      | .36   | .07   | 4.25 | 1.06   | 17.34 |        |      |
| 1958                                                                                                                                                                 | P                 | 2.61 | 1.54                                      | 3.44 | 7.10    | 3.46 | 4.83    | 6.16                                                      | .99      | 9.61  | 1.02  | 3.47 | 1.77   | 46.00 |        |      |
|                                                                                                                                                                      | Q                 | .30  | .05                                       | .52  | 2.15    | 1.06 | .06     | .43                                                       | 0        | 1.53  | 0     | .30  | .08    | 6.48  |        |      |
| 1959                                                                                                                                                                 | P                 | 3.89 | 3.70                                      | 3.21 | 3.85    | 4.97 | 5.79    | 3.89                                                      | 3.91     | 2.72  | 2.18  | 3.55 | 6.87   | 48.53 |        |      |
|                                                                                                                                                                      | Q                 | 1.22 | 1.40                                      | .54  | .51     | .68  | 1.82    | .14                                                       | .04      | .10   | .02   | .10  | 2.18   | 8.75  |        |      |
| Normal P                                                                                                                                                             |                   | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17                                                      | 3.13     | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                              |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-5                         |          |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                                 | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                                           |          |       |       |      |        |       |        |      |
|                                                                                                                                                                      |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                                           | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                      | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                                                      | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                                 | 11-13             | 0.56 | 11-13                                     | 0.54 | 11-13   | 0.95 | 11-13   | 1.76                                                      | 11-13    | 2.26  | 1-31  | 2.48 | 1-30   | 3.72  | 1-27   | 5.25 |
| 1958                                                                                                                                                                 | 4-3               | .32  | 4-3                                       | .26  | 4-3     | .39  | 4-3     | .52                                                       | 4-3      | .76   | 9-19  | .99  | 9-19   | 1.16  | 4-25   | 1.61 |
| 1959                                                                                                                                                                 | 6-10              | .61  | 6-10                                      | .48  | 6-10    | .63  | 6-11    | .84                                                       | 6-11     | .89   | 6-10  | 1.58 | 6-10   | 1.67  | 12-11  | 2.00 |
| Notes: Quality of records: Q - poor in 1957, good in 1958, good in 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss. |                   |      |                                           |      |         |      |         |                                                           |          |       |       |      |        |       |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | Oxford, Mississippi Watershed W-5 |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|-----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                  |                      |                    | Rainfall         |                      |                  | Runoff                            |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                  | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of April 3, 1958                                                                                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  |                                   |                 |                  |
| 3-4-5-58                                                                                                                                                                                                                                                                                                                               | 0                    | 0                  | 4-3-58           | Rain Gage 8          |                  | 4-3-58                            |                 |                  |
| 3-6                                                                                                                                                                                                                                                                                                                                    | .04                  | 0                  | 4:40p            | 0                    | 0                | 4:55p                             | .0123           | 0                |
| 3-7                                                                                                                                                                                                                                                                                                                                    | .61                  | .0758              | :45              | .24                  | .02              | 5:15                              | .0351           | .0076            |
| 3-8                                                                                                                                                                                                                                                                                                                                    | .48                  | .0779              | :50              | .48                  | .06              | :25                               | .0772           | .0163            |
| 3-9                                                                                                                                                                                                                                                                                                                                    | 0                    | .0358              | 5:00             | 1.26                 | .27              | :30                               | .1343           | .0251            |
| 3-10                                                                                                                                                                                                                                                                                                                                   | 0                    | .0021              | :05              | 1.20                 | .37              | :45                               | .2545           | .0737            |
| 3-11                                                                                                                                                                                                                                                                                                                                   | 0                    | 0                  | :10              | 2.40                 | .57              | 6:00                              | .3072           | .1451            |
| 3-12                                                                                                                                                                                                                                                                                                                                   | .08                  | 0                  | :25              | .08                  | .59              | :15                               | .2677           | .2179            |
| 3-13                                                                                                                                                                                                                                                                                                                                   | .06                  | 0                  | :30              | 1.20                 | .69              | :30                               | .2018           | .2767            |
| 3-14-16                                                                                                                                                                                                                                                                                                                                | 0                    | 0                  |                  |                      |                  | :45                               | .1571           | .3206            |
| 3-17                                                                                                                                                                                                                                                                                                                                   | .60                  | .0548              |                  |                      |                  | 7:00                              | .1220           | .3554            |
| 3-18                                                                                                                                                                                                                                                                                                                                   | 0                    | .0063              |                  |                      |                  | :30                               | .0755           | .4040            |
| 3-19                                                                                                                                                                                                                                                                                                                                   | 0                    | .0021              |                  |                      |                  | 8:15                              | .0465           | .4480            |
| 3-20-21                                                                                                                                                                                                                                                                                                                                | 0                    | 0                  |                  |                      |                  | 9:00                              | .0333           | .4767            |
| 3-22                                                                                                                                                                                                                                                                                                                                   | .04                  | 0                  |                  |                      |                  | 10:00                             | .0202           | .5029            |
| 3-23                                                                                                                                                                                                                                                                                                                                   | .87                  | .0779              |                  |                      |                  | 12:00m                            | .0114           | .5343            |
| 3-24                                                                                                                                                                                                                                                                                                                                   | .02                  | .0611              |                  |                      |                  | 4-4-58                            |                 |                  |
| 3-25                                                                                                                                                                                                                                                                                                                                   | .23                  | .0105              |                  |                      |                  | 5:00a                             | .0051           | .5758            |
| 3-26                                                                                                                                                                                                                                                                                                                                   | .26                  | .0927              |                  |                      |                  | 12:00n                            | .0025           | .6024            |
| 3-27                                                                                                                                                                                                                                                                                                                                   | 0                    | .0105              |                  |                      |                  | 12:00m                            | .0009           | .6228            |
| 3-28                                                                                                                                                                                                                                                                                                                                   | 0                    | .0042              |                  |                      |                  |                                   |                 |                  |
| 3-29                                                                                                                                                                                                                                                                                                                                   | .05                  | .0021              |                  |                      |                  |                                   |                 |                  |
| 3-30                                                                                                                                                                                                                                                                                                                                   | .09                  | .0021              |                  |                      |                  |                                   |                 |                  |
| 3-31                                                                                                                                                                                                                                                                                                                                   | 0                    | .0021              |                  |                      |                  |                                   |                 |                  |
| 4-1                                                                                                                                                                                                                                                                                                                                    | 0                    | 0                  |                  |                      |                  |                                   |                 |                  |
| 4-2                                                                                                                                                                                                                                                                                                                                    | .04                  | 0                  |                  |                      |                  |                                   |                 |                  |
| 4-3                                                                                                                                                                                                                                                                                                                                    | .99                  | .2447 1/2          |                  |                      |                  |                                   |                 |                  |
| Watershed Conditions: 27% of area<br>tilled for planting of row crops;<br>30% pasture, 20% idle, 21% woods -<br>good to fair cover; 2% bare gullies.                                                                                                                                                                                   |                      |                    |                  |                      |                  |                                   |                 |                  |
| Event of June 10, 1959                                                                                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  |                                   |                 |                  |
| 5-12-59                                                                                                                                                                                                                                                                                                                                | 0                    | 0                  | 6-10-59          | Rain Gage 8          |                  | 6-10-59                           |                 |                  |
| 5-13-21                                                                                                                                                                                                                                                                                                                                | 0                    | 0                  | 12:20p           | 0                    | 0                | 12:45p                            | 0               | 0                |
| 5-22                                                                                                                                                                                                                                                                                                                                   | 1.52                 | 0.1188             | :30              | 0.48                 | 0.08             | 1:00                              | .0150           | .0018            |
| 5-23-25                                                                                                                                                                                                                                                                                                                                | 0                    | .0012              | :45              | 1.00                 | .33              | :15                               | .2960           | .0405            |
| 5-26                                                                                                                                                                                                                                                                                                                                   | 1.42                 | .1663              | 1:00             | 2.52                 | .96              | :30                               | .5850           | .1506            |
| 5-27                                                                                                                                                                                                                                                                                                                                   | .13                  | .0950              | :10              | 2.04                 | 1.30             | :35                               | .6073           | .2003            |
| 5-28                                                                                                                                                                                                                                                                                                                                   | 0                    | 0                  |                  |                      |                  | :45                               | .5550           | .2972            |
| 5-29                                                                                                                                                                                                                                                                                                                                   | .05                  | 0                  |                  |                      |                  | 2:00                              | .4200           | .4191            |
| 5-30                                                                                                                                                                                                                                                                                                                                   | 1.11                 | .0843              |                  |                      |                  | :15                               | .2790           | .5065            |
| 5-31                                                                                                                                                                                                                                                                                                                                   | 0                    | .0012              |                  |                      |                  | :30                               | .1877           | .5648            |
| 6-1-4                                                                                                                                                                                                                                                                                                                                  | 0                    | 0                  |                  |                      |                  | 3:00                              | .0819           | .6267            |
| 6-5                                                                                                                                                                                                                                                                                                                                    | .10                  | 0                  |                  |                      |                  | :45                               | .0370           | .6691            |
| 6-6                                                                                                                                                                                                                                                                                                                                    | 0                    | 0                  |                  |                      |                  | 6:00                              | .0086           | .7130            |
| 6-7                                                                                                                                                                                                                                                                                                                                    | .38                  | 0                  |                  |                      |                  | 9:00                              | .0039           | .7316            |
| 6-8                                                                                                                                                                                                                                                                                                                                    | .34                  | 0                  |                  |                      |                  | 12:00m                            | .0024           | .7409            |
| 6-9                                                                                                                                                                                                                                                                                                                                    | .73                  | .0594              |                  |                      |                  | 6-11-59                           |                 |                  |
|                                                                                                                                                                                                                                                                                                                                        |                      |                    |                  |                      |                  | 4:00a                             | .0009           | .7473            |
| Watershed Conditions: 26% of area<br>under cultivation in cotton and<br>corn - poor to fair cover; 30%<br>in pasture, 21% idle, 21% woods -<br>good cover; 2% bare gullies.                                                                                                                                                            |                      |                    |                  |                      |                  |                                   |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 1,139.4.<br>For additional events and map of watershed see "Selected Runoff Events for Small Agricultural Watersheds<br>in the United States," ARS-SWC, January 1960, pages 62.2-1 and 62.2-3.<br>For watershed location see Figure 1, page 62.11-5.<br>1/ Runoff 9:00a - 4:55p. |                      |                    |                  |                      |                  |                                   |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                   |                      |                     |                  |                      |                  | Oxford, Mississippi Watershed W-5 |                 |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|------------------|----------------------|------------------|-----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                    |                      |                     | Rainfall         |                      |                  | Runoff                            |                 |                  |
| Date                                                                                                                                                                                                                                                                                     | Rainfall<br>(inches) | Runoff<br>(inches)  | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                  | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 11, 1959                                                                                                                                                                                                                                                                   |                      |                     |                  |                      |                  |                                   |                 |                  |
| 5-12-59                                                                                                                                                                                                                                                                                  | 0                    | 0                   | 6-11-59          | Rain Gage 8          |                  | 6-11-59                           |                 |                  |
| 5-13-21                                                                                                                                                                                                                                                                                  | 0                    | 0                   | 7:35a            | 0                    | 0                | 7:37a                             | .0004           | 0                |
| 5-22                                                                                                                                                                                                                                                                                     | 1.52                 | .1188               | :45              | 4.08                 | .68              | :45                               | .0132           | .0011            |
| 5-23-25                                                                                                                                                                                                                                                                                  | 0                    | .0012               | 8:00             | 1.24                 | .99              | :50                               | .0500           | .0037            |
| 5-26                                                                                                                                                                                                                                                                                     | 1.42                 | .1663               | :30              | .22                  | 1.10             | :55                               | .1184           | .0107            |
| 5-27                                                                                                                                                                                                                                                                                     | .13                  | .0950               | 9:00             | .18                  | 1.19             | 8:05                              | .2413           | .0400            |
| 5-28                                                                                                                                                                                                                                                                                     | 0                    | 0                   | 10:00            | .12                  | 1.31             | :15                               | .4256           | .0956            |
| 5-29                                                                                                                                                                                                                                                                                     | .05                  | 0                   |                  |                      |                  | :30                               | .4994           | .2112            |
| 5-30                                                                                                                                                                                                                                                                                     | 1.11                 | .0843               |                  |                      |                  | :45                               | .4520           | .3301            |
| 5-31                                                                                                                                                                                                                                                                                     | 0                    | .0012               |                  |                      |                  | 9:00                              | .3230           | .4270            |
| 6-1-4                                                                                                                                                                                                                                                                                    | 0                    | 0                   |                  |                      |                  | :30                               | .2326           | .5713            |
| 6-5                                                                                                                                                                                                                                                                                      | .10                  | 0                   |                  |                      |                  | 10:00                             | .1588           | .6686            |
| 6-6                                                                                                                                                                                                                                                                                      | 0                    | 0                   |                  |                      |                  | 11:00                             | .0720           | .7808            |
| 6-7                                                                                                                                                                                                                                                                                      | .38                  | 0                   |                  |                      |                  | 12:30p                            | .0228           | .8456            |
| 6-8                                                                                                                                                                                                                                                                                      | .34                  | 0                   |                  |                      |                  | 3:00                              | .0053           | .8738            |
| 6-9                                                                                                                                                                                                                                                                                      | .73                  | .0594               |                  |                      |                  | 6:00                              | .0016           | .8840            |
| 6-10                                                                                                                                                                                                                                                                                     | 1.30                 | .7457               |                  |                      |                  | 9:00                              | .0008           | .8876            |
| 6-11                                                                                                                                                                                                                                                                                     | 0                    | .0066 <sup>1/</sup> |                  |                      |                  | 12:00m                            | .0006           | .8897            |
| Watershed Conditions: 26% of area under cultivation in cotton and corn - poor to fair cover; 30% in pasture, 21% idle, 21% woods - good cover; 2% bare gullies.                                                                                                                          |                      |                     |                  |                      |                  |                                   |                 |                  |
| <div> <p style="text-align: center;">Rain Gage 8</p> <p style="text-align: center;">April 3, 1958</p> <p style="text-align: center;">OXFORD, MISSISSIPPI WATERSHED W-5</p> </div>                                                                                                        |                      |                     |                  |                      |                  |                                   |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 1139.4.<br>For additional events and map of watershed see "Selected Runoff Events for Small Agricultural Watersheds in the United States," ARS-SWC, January 1960, pages 62.2-1 and 62.2-3.<br><sup>1/</sup> Runoff prior to 7:37a. |                      |                     |                  |                      |                  |                                   |                 |                  |



OXFORD, MISSISSIPPI WATERSHED W-5



OXFORD, MISSISSIPPI Watershed W-10

LOCATION: Marshall Co., Miss.; 3.3 mi. NW. of Chulahoma, on county road; Dry Fork Creek, Pigeon Roost Creek Watershed, Yazoon River Basin.

AREA: 5,530 ac. (8.64 sq. mi.)

SHAPE: Almost square; 3 mi. wide, 2.9 mi. long.

SLOPES: 14% is in 0-2% class; 24% in 2-5%; 6% in 5-8%; 5% in 8-12%; 16% in 12-17%; 35% in 17% and above. Aspect NW.

SOILS: Loessial and Coastal Plains; topsoil - 12% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 8% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 14% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 50% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 16% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 12% moderate to moderately slow permeability impeding layer at approximately 30 ins.; 8% slow permeability, impeding layer at 15 to 20 ins.; 14% moderate to slow permeability, impeding layer at 15 to 20 ins.; 50% moderate to rapid permeability, no impeding layer; 16% moderate to moderately rapid permeability, no impeding layer. Internal drainage - medium to slow. Loring silt loam - 12%; Grenada silt loam - 8%; Providence silt loam and silty clay loam - 14%; Ruston fine sandy loam - 50%; Hymon loam - 16%.

EROSION: + - 16%; 2 - 18%; 3-- 66%.

LAND CAPABILITY: II - 20%; III - 16%; IV - 10%; VI - 12%; VII - 42%.

SURFACE DRAINAGE: Good, length of principal waterway - 4 mi.; sand bed channels. About 12% non-contributing area due to small desilting and retention dams.

CHARACTER OF FLOW: Spring-fed intermittent, continuous.

INSTRUMENTATION: Runoff - current meter rated section of natural sand-bottom channel; continuous water-stage recorder; cableway at site. Precipitation - five recording gages.

WATERSHED CONDITIONS: Normally about 20% is in cultivation - cotton and corn, 53% idle - fair to poor cover condition in common grasses and broom sedge, 9% in pasture - fair to poor cover; 15% woods - fair to poor cover; 3% bare gullies.

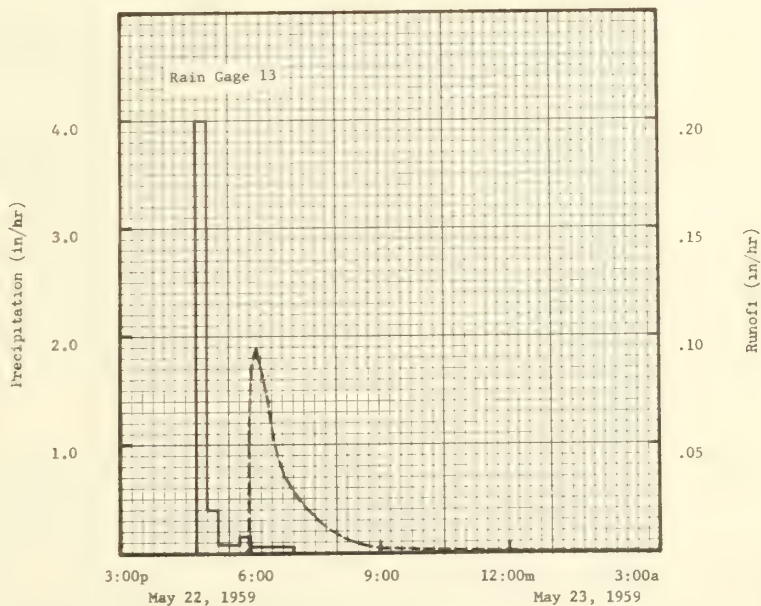
GENERALLY REPRESENTS: Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                         |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-10<br>(Area - 5,530 Acres) |          |       |       |      |        |       |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------------------------------------------------------------|----------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                     |                   | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July                                                       | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                              | P                 | 8.06 | 6.68                                      | 2.49 | 7.02    | 6.22 | 7.25    | 2.67                                                       | 2.27     | 6.78  | 3.46  | 9.93 | 4.96   | 67.79 |        |      |
|                                                                                                                                                                   | Q                 | 3.57 | 2.01                                      | .08  | 2.22    | 2.10 | .69     | .25                                                        | .15      | .88   | .06   | 3.65 | 1.38   | 17.04 |        |      |
| 1958                                                                                                                                                              | P                 | 2.94 | 1.92                                      | 3.85 | 7.46    | 4.84 | 4.35    | 6.46                                                       | .72      | 10.05 | 1.04  | 3.48 | 1.70   | 48.81 |        |      |
|                                                                                                                                                                   | Q                 | .55  | .21                                       | .65  | 2.13    | 1.29 | .14     | .52                                                        | 0        | 1.66  | .01   | .42  | 0      | 7.58  |        |      |
| 1959                                                                                                                                                              | P                 | 4.21 | 4.22                                      | 3.51 | 4.37    | 5.46 | 3.88    | 5.32                                                       | 4.29     | 3.57  | 2.04  | 3.02 | 6.81   | 50.70 |        |      |
|                                                                                                                                                                   | Q                 | .87  | 1.13                                      | .43  | .64     | .38  | .58     | .36                                                        | .29      | .28   | .04   | .03  | 1.36   | 6.39  |        |      |
| Normal                                                                                                                                                            | P                 | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17                                                       | 3.13     | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                           |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-10                         |          |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                              | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                                            |          |       |       |      |        |       |        |      |
|                                                                                                                                                                   |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                                            | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                   | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                                                       | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                              | 11-18             | 0.36 | 5-22                                      | 0.34 | 5-22    | 0.61 | 5-22    | 0.94                                                       | 1-31     | 1.22  | 1-31  | 2.04 | 1-30   | 2.98  | 1-27   | 4.08 |
| 1958                                                                                                                                                              | 4-3               | .49  | 4-3                                       | .41  | 4-3     | .62  | 4-3     | .89                                                        | 4-3      | .95   | 9-19  | 1.11 | 9-19   | 1.26  | 4-25   | 1.46 |
| 1959                                                                                                                                                              | 6-11              | .20  | 6-11                                      | .18  | 6-11    | .28  | 2-13    | .43                                                        | 2-13     | .47   | 2-13  | .69  | 2-12   | .81   | 12-11  | 1.24 |
| Notes: Quality of records: Q - fair for 1957 and 1958, good for 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss. |                   |      |                                           |      |         |      |         |                                                            |          |       |       |      |        |       |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

| SELECTED RUNOFF EVENTS |                                    |                    |                  |                            |                  | Oxford, Mississippi Watershed W-10 |                 |                  |
|------------------------|------------------------------------|--------------------|------------------|----------------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions  |                                    |                    | Rainfall         |                            |                  | Runoff                             |                 |                  |
| Date                   | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr)       | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of May 22, 1959  |                                    |                    |                  |                            |                  |                                    |                 |                  |
| 4-22-59                | 0                                  | .0034              | 5-22-59          | Rain Gage 13 <sup>2/</sup> |                  | 5-22-59                            |                 |                  |
| 4-23                   | 0                                  | .0026              | 4:45p            | 0                          | 0                | 4:55a                              | 0               | 0                |
| 4-24                   | 0                                  | .0022              | 5:00             | 1.01                       | 4.04             | 5:55                               | .0006           | .0003            |
| 4-25                   | 0                                  | .0013              | :15              | 1.11                       | .40              | 6:00                               | .0516           | .0025            |
| 4-26                   | 0                                  | .0009              | :45              | 1.16                       | .08              | :05                                | .0834           | .0081            |
| 4-27                   | T                                  | .0004              | 6:00             | 1.20                       | .16              | 6:10                               | .0941           | .0156            |
| 4-28-30                | 0                                  | 0                  | 7:00             | 1.25                       | .05              | :20                                | .0789           | .0300            |
| 5-1-9                  | 0                                  | 0                  |                  |                            |                  | :45                                | .0373           | .0544            |
| 5-10                   | .26                                | .0009              | 5-22-59          | Rain Gages <sup>1/</sup>   |                  | 7:30                               | .0165           | .0736            |
| 5-11                   | .45                                | .0004              | 4:30 p           | 0                          | 0                | 8:30                               | .0047           | .0876            |
| 5-12                   | .72                                | .0006              | :45              | .16                        | .04              | 10:00                              | .0016           | .0876            |
| 5-13                   | 0                                  | .0020              | 5:00             | 3.44                       | .90              | 12:00m                             | .0004           | .0896            |
| 5-14-21                | 0                                  | 0                  | :15              | .44                        | 1.01             | 5-23-59                            |                 |                  |
| 5-22                   | .17 <sup>3/</sup>                  | 0                  | 6:00             | .11                        | 1.09             | 3:00p                              | .0001           | .0905            |
|                        |                                    |                    | 7:00             | .06                        | 1.15             |                                    |                 |                  |

Watershed Conditions: 20% of area under cultivation in cotton and corn - poor to fair cover; 9% pasture, 53% idle, 15% woods - good cover; 3% bare gullies.

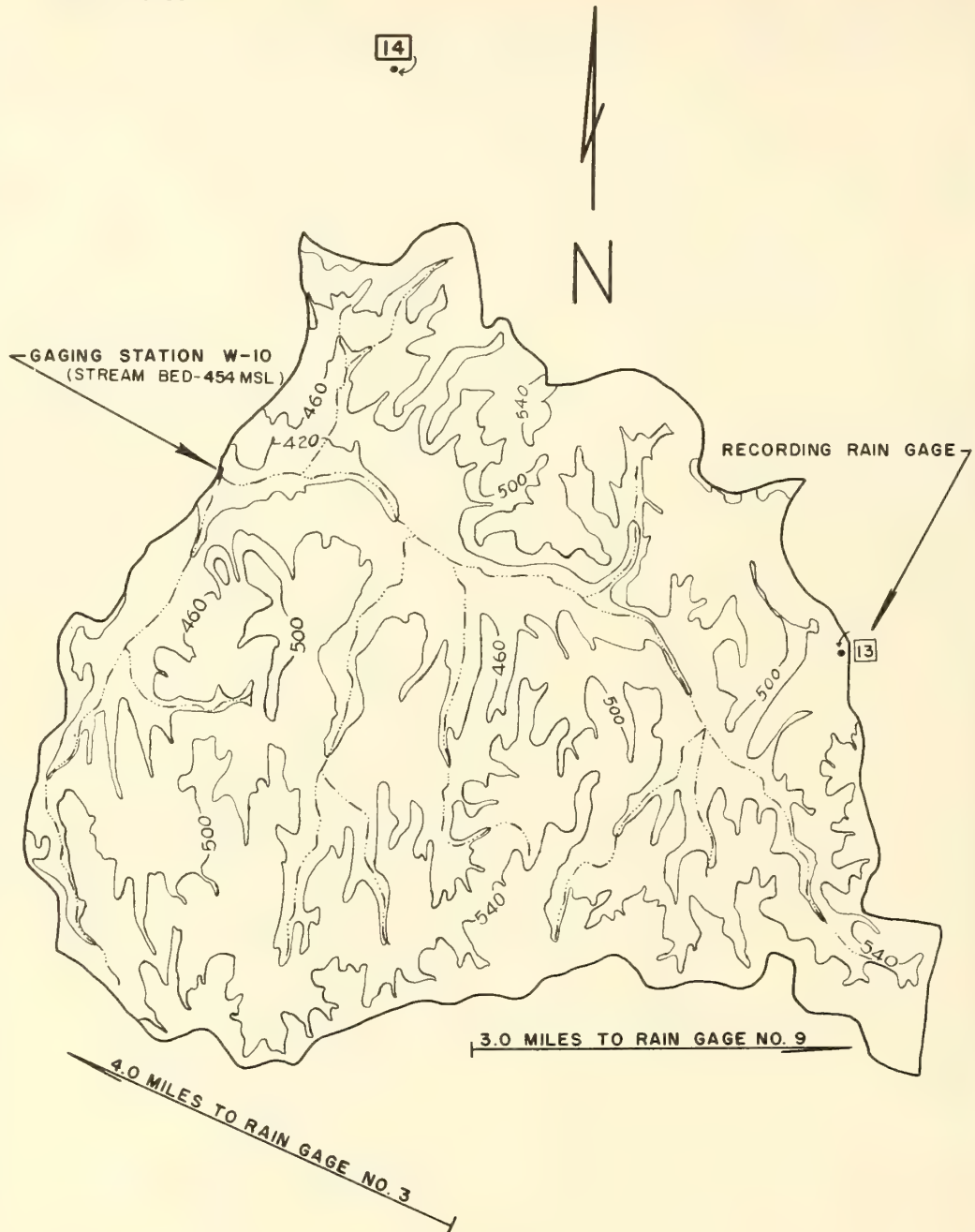


OXFORD, MISSISSIPPI WATERSHED W-10

Notes: To convert runoff in in/hr to cfs, multiply by 5,576.  
For additional events see "Selected Runoff Events for Small Agricultural Watersheds in the United States," ARS-SWC, January 1960, pages 62.3-1, 2.  
1/ Rain gages 3, 9, 10, 13, and 14 Thiessen weighted.  
2/ Rainfall for gage 10 listed on page 62.12-3 and for gages 3, 9, 13, and 14 listed on pages 62.10 - 3.  
3/ Rainfall between 4:30a and 7:00a.

Cooperative Research Project of USDA, University of Mississippi and Mississippi State University

REVISED 5-62



SCALE IN MILES

CONTOUR INTERVAL - 40 FEET

NOTE: FOR WATERSHED LOCATION  
SEE FIGURE 1, PAGE 62.11-5

OXFORD, MISSISSIPPI  
WATERSHED W-10  
AREA: 5530 ACRES

OXFORD, MISSISSIPPI Watershed W-12

LOCATION: Marshall Co., Miss.; 5.6 mi. SW. of Holly Springs, on county road; Pigeon Roost Creek Watershed, Yazoo River Basin.

AREA: 22,800 ac. (35.6 sq. mi.)

SHAPE: Fan; 4 mi. wide, 9 mi. long.

SLOPES: 20% is in 0-2% class; 21% in 2-5%; 7% in 5-8%; 7% in 8-12%; 12% in 12-17%; 33% in 17% and above. Aspect W.

SOILS: Loessial and Coastal Plains; topsoil - 6% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 9% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 13% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 52% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 20% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 6% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 9% slow permeability, impeding layer at 15 to 20 ins.; 13% moderate to slow permeability, impeding layer at 15 to 20 ins.; 52% moderate to rapid permeability, no impeding layer; 20% moderate to moderately rapid permeability, no impeding layer. Internal drainage - medium to slow. Loring silt loam - 6%; Grenada silt loam - 9%; Providence silt loam and silty clay loam - 13%; Ruston fine sandy loam - 52%; Hymen loam - 20%.

EROSION: + - 20%; 2 - 21%; 3 - 59%.

LAND CAPABILITY: II - 14%, III - 17%; IV - 6%; VI - 12%; VII - 51%.

SURFACE DRAINAGE: Good; two principal channels: Pigeon Roost Creek - 6.5 mi. long, Jones Creek - 5.5 mi. long; sand bed channels. About 15% non-contributing area due to small desilting and retention dams.

CHARACTER OF FLOW: Perennial, continuous.

INSTRUMENTATION: Runoff - current meter rated section of dredged sand-bottom channel; continuous water-stage recorder; cableway at site. Precipitation - eight recording gages, increased to 15 recording gages, July, 1959.

WATERSHED CONDITIONS: Normally about 20% is in cultivation - cotton and corn, 39% idle - good to poor cover in common grasses and broom sedge, 13% pasture - good to poor cover; 23% woods - good to fair cover; 3% urban, town of Holly Springs; 2% bare gullies.

GENERALLY REPRESENTS: Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

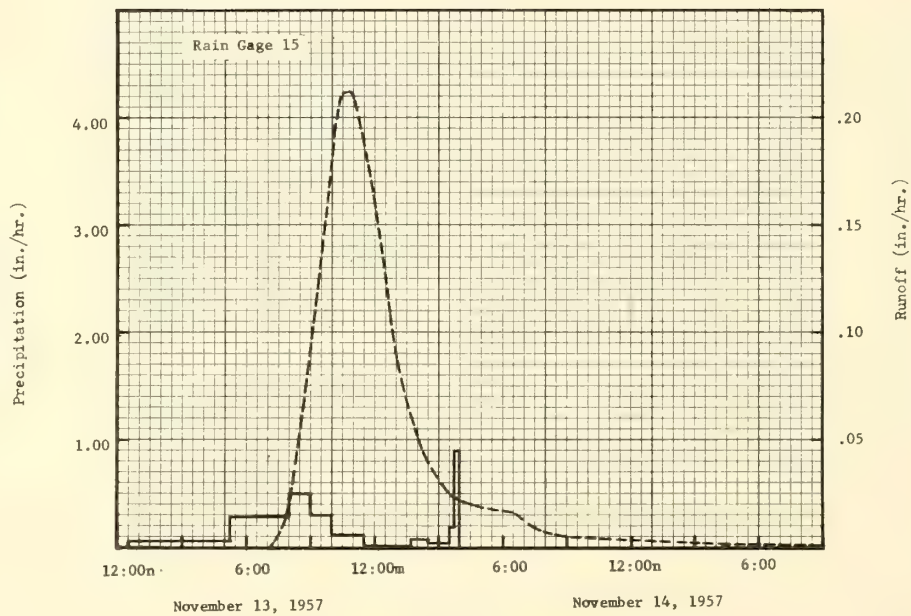
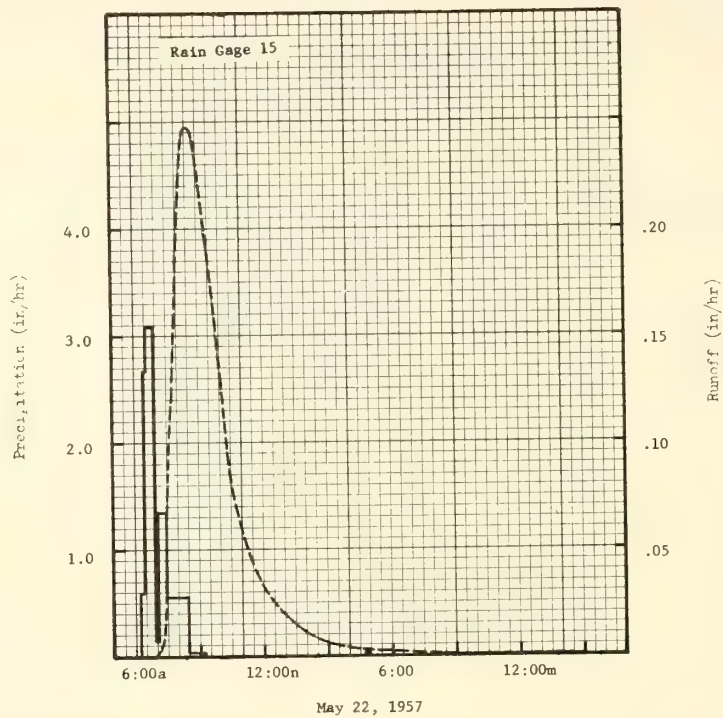
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                       |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-12<br>(Area - 22,800 Acres) |          |       |       |      |        |       |        |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|-------------------------------------------------------------|----------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                   |                   | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July                                                        | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                            | P                 | 7.99 | 6.77                                      | 2.46 | 6.42    | 5.52 | 5.89    | 3.68                                                        | 1.34     | 6.28  | 3.64  | 9.16 | 4.65   | 63.80 |        |      |
|                                                                                                                                                                 | Q                 | 2.66 | 1.48                                      | .08  | 1.25    | .89  | .49     | .29                                                         | .01      | .41   | .06   | 2.13 | 1.14   | 10.89 |        |      |
| 1958                                                                                                                                                            | P                 | 2.78 | 1.58                                      | 3.53 | 6.66    | 4.17 | 5.31    | 6.83                                                        | 1.12     | 8.95  | .98   | 3.50 | 1.65   | 47.06 |        |      |
|                                                                                                                                                                 | Q                 | .27  | .06                                       | .18  | .97     | .82  | .10     | .41                                                         | .02      | .72   | .01   | .11  | .02    | 3.69  |        |      |
| 1959                                                                                                                                                            | P                 | 3.89 | 3.85                                      | 3.23 | 4.02    | 4.90 | 4.49    | 4.10                                                        | 5.16     | 3.05  | 2.20  | 3.37 | 6.78   | 49.04 |        |      |
|                                                                                                                                                                 | Q                 | .57  | .62                                       | .23  | .33     | .27  | .67     | .06                                                         | .20      | .21   | .01   | .02  | 1.09   | 4.28  |        |      |
| Normal P                                                                                                                                                        |                   | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17                                                        | 3.13     | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                         |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-12                          |          |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                            | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                                             |          |       |       |      |        |       |        |      |
|                                                                                                                                                                 |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                                             | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                 | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                                                        | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                            | 5-22              | 0.23 | 5-22                                      | 0.22 | 5-22    | 0.41 | 5-22    | 0.64                                                        | 1-31     | 0.83  | 1-31  | 1.56 | 1-30   | 2.28  | 1-27   | 3.07 |
| 1958                                                                                                                                                            | 7-22              | .10  | 7-22                                      | .10  | 7-22    | .16  | 5-1     | .33                                                         | 9-20     | .39   | 9-19  | .60  | 9-19   | .68   | 4-25   | .95  |
| 1959                                                                                                                                                            | 12-18             | .11  | 6-10                                      | .11  | 6-10    | .20  | 12-18   | .40                                                         | 12-18    | .44   | 6-10  | .54  | 12-17  | .65   | 12-11  | 1.01 |
| Notes: Quality of records: Q - fair in 1957 and 1958, good in 1959; P - good. Normal P based on 33 yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss. |                   |      |                                           |      |         |      |         |                                                             |          |       |       |      |        |       |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

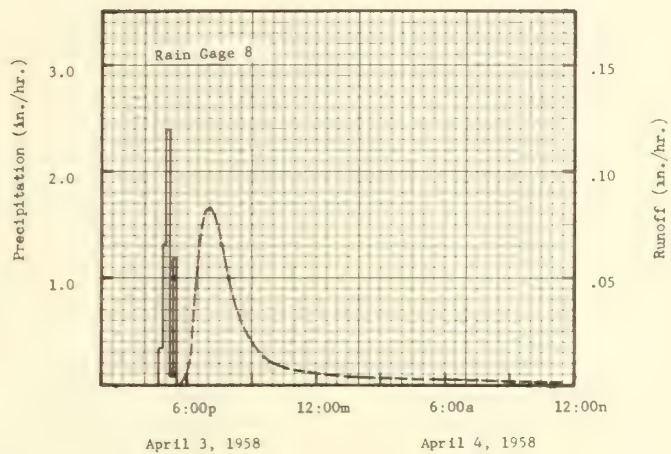


| SELECTED RUNOFF EVENTS                                                                                                                                         |                                    |                     |                  |                          |                  | Oxford, Mississippi Watershed W-12 |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------|------------------|--------------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                          |                                    |                     | Rainfall         |                          |                  | Runoff                             |                 |                  |
| Date                                                                                                                                                           | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches)  | Date and<br>time | Intensity<br>(in/hr)     | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of May 22, 1957                                                                                                                                          |                                    |                     |                  |                          |                  |                                    |                 |                  |
| 4-23-57                                                                                                                                                        | 0                                  | .0721               | 5-22-57          | Rain Gage 15             |                  | 5-22-57                            |                 |                  |
| 4-24                                                                                                                                                           | 0                                  | .0036               | 12:15a           | 0                        | 0                | 6:30a                              | 0               | 0                |
| 4-25                                                                                                                                                           | .60                                | .1097               | 5:15             | T                        | 0                | 7:00                               | .0004           | .0001            |
| 4-26                                                                                                                                                           | 0                                  | .0051               | 6:15             | .05                      | .05              | :15                                | .0025           | .0037            |
| 4-27                                                                                                                                                           | 0                                  | .0025               | :20              | .60                      | .10              | :30                                | .0710           | .0172            |
| 4-28                                                                                                                                                           | .03                                | .0025               | :35              | 2.68                     | .72              | :45                                | .1185           | .0396            |
| 4-29                                                                                                                                                           | .37                                | .0251               | :55              | 3.09                     | 1.75             | 8:00                               | .1900           | .0787            |
| 4-30                                                                                                                                                           | 0                                  | .0025               | 7:02             | .17                      | 1.77             | :15                                | .2310           | .1315            |
| 5-1                                                                                                                                                            | .22                                | .0115               | :25              | 1.33                     | 2.53             | :30                                | .2475           | .1923            |
| 5-2                                                                                                                                                            | .21                                | .0019               | 8:25             | .53                      | 2.81             | :45                                | .2450           | .2542            |
| 5-3-8                                                                                                                                                          | 0                                  | .0055               | 9:15             | .04                      | 2.84             | 9:00                               | .2275           | .3132            |
| 5-9-12                                                                                                                                                         | 0                                  | .0036               |                  |                          |                  | :30                                | .1860           | .4171            |
| 5-13                                                                                                                                                           | .20                                | .0009               | 5-22-57          | Rain Gages <sup>1/</sup> |                  | 10:00                              | .1350           | .4963            |
| 5-14                                                                                                                                                           | .10                                | .0008               | 4:00a            | 0                        | 0                | :30                                | .0818           | .5494            |
| 5-15                                                                                                                                                           | 0                                  | .0007               | 6:00             | T                        | .01              | 11:00                              | .0582           | .5834            |
| 5-16                                                                                                                                                           | .64                                | .0355               | :15              | 0                        | .01              | 12:00n                             | .0312           | .6242            |
| 5-17                                                                                                                                                           | T                                  | .0036               | :30              | .88                      | .23              | 1:30p                              | .0150           | .6579            |
| 5-18                                                                                                                                                           | 1.27                               | .0008               | :45              | 2.48                     | .85              | 3:00                               | .0060           | .6722            |
| 5-19                                                                                                                                                           | .06                                | .0449               | 7:00             | 1.20                     | 1.15             | 6:00                               | .0022           | .6839            |
| 5-20                                                                                                                                                           | 0                                  | .0010               | :30              | .98                      | 1.64             | 9:00                               | .0012           | .6887            |
| 5-21                                                                                                                                                           | 0                                  | .0007               | 8:00             | .46                      | 1.87             | 12:00n                             | .0004           | .6906            |
| 5-22                                                                                                                                                           | 0                                  | .0001 <sup>2/</sup> | :30              | .26                      | 2.00             | 5-23-57                            |                 |                  |
|                                                                                                                                                                |                                    |                     | 9:15             | .02                      | 2.01             | 3:00a                              | 0               | .6913            |
| Watershed Conditions: 20% of area under cultivation in cotton and corn - fair cover; 13% pasture, 39% idle, 23% woods - good cover; 3% urban; 2% bare gullies. |                                    |                     | 5-22-57          | Rain Gages <sup>3/</sup> |                  |                                    |                 |                  |
| Event of November 13-14, 1957                                                                                                                                  |                                    |                     |                  |                          |                  |                                    |                 |                  |
| 10-12-57                                                                                                                                                       | 0                                  | .0002               | 11-13-57         | Rain Gage 15             |                  | 11-13-57                           |                 |                  |
| 10-13-14                                                                                                                                                       | 0                                  | .0004               | 12:30p           | 0                        | 0                | 12:30a                             | 0               | 0                |
| 10-15                                                                                                                                                          | .14                                | .0002               | 5:15             | .07                      | .35              | 3:45                               | .0001           | .0002            |
| 10-16                                                                                                                                                          | .38                                | .0005               | 8:00             | .29                      | 1.15             | 6:00                               | .0003           | .0006            |
| 10-17-21                                                                                                                                                       | 0                                  | .0025               | 9:00             | .50                      | 1.65             | 7:00                               | .0017           | .0014            |
| 10-22                                                                                                                                                          | .65                                | .0007               | 10:00            | .30                      | 1.95             | :30                                | .0087           | .0038            |
| 10-23                                                                                                                                                          | .94                                | .0021               | 11:30            | .11                      | 2.12             | 8:00                               | .0303           | .0132            |
| 10-24-27                                                                                                                                                       | 0                                  | .0012               | 11-14-57         |                          |                  | 9:00                               | .0892           | .0724            |
| 10-28                                                                                                                                                          | .02                                | .0003               | 1:45a            | .01                      | 2.15             | 10:00                              | .1618           | .1962            |
| 10-29                                                                                                                                                          | .09                                | .0003               | 2:30             | .08                      | 2.21             | :30                                | .1801           | .2822            |
| 10-30                                                                                                                                                          | .19                                | .0005               | 3:30             | .04                      | 2.25             | :40                                | .1818           | .3124            |
| 10-31                                                                                                                                                          | .01                                | .0003               | :45              | .20                      | 2.30             | 11:15                              | .1644           | .4135            |
| 11-1                                                                                                                                                           | 0                                  | .0003               | :55              | .90                      | 2.45             | 12:00m                             | .1314           | .5251            |
| 11-2                                                                                                                                                           | .05                                | .0005               |                  |                          |                  | 11-14-57                           |                 |                  |
| 11-3                                                                                                                                                           | .10                                | .0003               |                  |                          |                  | 1:00a                              | .0848           | .6328            |
| 11-4-6                                                                                                                                                         | 0                                  | .0009               | 11-13-57         | Rain Gages <sup>1/</sup> |                  | 2:00a                              | .0552           | .7027            |
| 11-7                                                                                                                                                           | 1.59                               | .0097               | 12:00n           | 0                        | 0                | 3:00                               | .0376           | .7489            |
| 11-8                                                                                                                                                           | .40                                | .1891               | 1:00p            | 0.02                     | .02              | 4:00                               | .0261           | .7800            |
| 11-9                                                                                                                                                           | 0                                  | .0009               | :30              | .14                      | .09              | 5:00                               | .0376           | .8115            |
| 11-10-11                                                                                                                                                       | 0                                  | .0010               | 2:30             | .09                      | .18              | :30                                | .0432           | .8317            |
| 11-12                                                                                                                                                          | .46                                | .0009 <sup>2/</sup> | 3:30             | .04                      | .22              | 6:00                               | .0479           | .8545            |
| 11-13                                                                                                                                                          | 0                                  | .0005 <sup>2/</sup> | 4:30             | .08                      | .30              | :30                                | .0411           | .8764            |
|                                                                                                                                                                |                                    |                     | 5:30             | .09                      | .39              | 7:00                               | .0338           | .8956            |
|                                                                                                                                                                |                                    |                     | 6:00             | .23                      | .51              | 9:00                               | .0150           | .9400            |
|                                                                                                                                                                |                                    |                     | 7:00             | .30                      | .81              | 12:00n                             | .0063           | .9712            |
| Notes: To convert runoff in in/hr to cfs, multiply by 22,990.                                                                                                  |                                    |                     |                  |                          |                  |                                    |                 |                  |
| 1/ Rain gages 4, 5, 6, 7, 8, 9, 13, and 15 Thiessen weighted.                                                                                                  |                                    |                     |                  |                          |                  |                                    |                 |                  |
| 2/ Base flow prior to runoff event.                                                                                                                            |                                    |                     |                  |                          |                  |                                    |                 |                  |
| 3/ For storm rainfall for rain gages 4, 5, 8, and 13, see page 62.5-2.                                                                                         |                                    |                     |                  |                          |                  |                                    |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                                                                                   |                                    |                     |                  |                          |                  | Oxford, Mississippi Watershed W-12 |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------|------------------|--------------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                    |                                    |                     | Rainfall         |                          |                  | Runoff                             |                 |                  |
| Date                                                                                                                                                                     | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches)  | Date and<br>time | Intensity<br>(in/hr)     | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of November 13-14, 1957 (Continued)                                                                                                                                |                                    |                     |                  |                          |                  |                                    |                 |                  |
| Watershed Conditions: 20% of area<br>in cotton and corn residue - fair<br>cover; 13% pasture, 39% idle,<br>23% woods - good to fair cover;<br>3% urban; 2% bare gullies. |                                    |                     | :30              | .62                      | 1.48             | 3:00p                              | .0030           | .9859            |
|                                                                                                                                                                          |                                    |                     | 9:00             | .72                      | 1.84             | 6:00                               | .0014           | .9922            |
|                                                                                                                                                                          |                                    |                     | :30              | .55                      | 2.12             | 10:00                              | .0007           | .9962            |
|                                                                                                                                                                          |                                    |                     | 10:00            | .30                      | 2.27             |                                    |                 |                  |
|                                                                                                                                                                          |                                    |                     | 11:30            | .15                      | 2.49             |                                    |                 |                  |
|                                                                                                                                                                          |                                    |                     | 12:00m           | .02                      | 2.50             |                                    |                 |                  |
|                                                                                                                                                                          |                                    |                     | 11-14-57         |                          |                  |                                    |                 |                  |
|                                                                                                                                                                          |                                    |                     | 2:00a            | .03                      | 2.56             |                                    |                 |                  |
|                                                                                                                                                                          |                                    |                     | 3:00             | .14                      | 2.70             |                                    |                 |                  |
|                                                                                                                                                                          |                                    |                     | 4:00             | .18                      | 2.88             |                                    |                 |                  |
|                                                                                                                                                                          |                                    |                     | 5:00             | .01                      | 2.89             |                                    |                 |                  |
|                                                                                                                                                                          |                                    |                     | 11-13-57         | Rain Gages <sup>2/</sup> |                  |                                    |                 |                  |
|                                                                                                                                                                          |                                    |                     |                  |                          |                  |                                    |                 |                  |
| Event of April 3, 1958                                                                                                                                                   |                                    |                     |                  |                          |                  |                                    |                 |                  |
| 3-4-58                                                                                                                                                                   | 0                                  | .0011               | 4-3-58           | Rain Gage 8              |                  | 4-3-58                             |                 |                  |
| 3-5                                                                                                                                                                      | 0                                  | .0011               | 4:40p            | 0                        | 0                | 5:50p                              | .0044           | 0                |
| 3-6                                                                                                                                                                      | .12                                | .0011               | :50              | .34                      | .06              | 6:05                               | .0086           | .0016            |
| 3-7                                                                                                                                                                      | .62                                | .0188               | 5:05             | 1.23                     | .37              | :15                                | .0270           | .0046            |
| 3-8                                                                                                                                                                      | .44                                | .0081               | :10              | 2.40                     | .57              | :30                                | .0574           | .0152            |
| 3-9                                                                                                                                                                      | 0                                  | .0136               | :25              | .08                      | .59              | :45                                | .0770           | .0320            |
| 3-10                                                                                                                                                                     | 0                                  | .0021               | :30              | 1.20                     | .69              | 7:00                               | .0835           | .0522            |
| 3-11                                                                                                                                                                     | 0                                  | .0017               |                  |                          |                  | :15                                | .0800           | .0728            |
| 3-12                                                                                                                                                                     | .07                                | .0017               | 4-3-58           | Rain Gage 15             |                  | :45                                | .0574           | .1072            |
| 3-13                                                                                                                                                                     | .06                                | .0015               | 4:30p            | 0                        | 0                | 8:30                               | .0291           | .1397            |
| 3-14-16                                                                                                                                                                  | 0                                  | .0033               | :45              | .20                      | .05              | 10:00                              | .0104           | .1660            |
| 3-17                                                                                                                                                                     | .62                                | .0104               | 5:00             | .64                      | .21              | 12:00m                             | .0057           | .1810            |
| 3-18-21                                                                                                                                                                  | 0                                  | .0099               | 5:15             | .16                      | .25              | 4-4-58                             |                 |                  |
| 3-22                                                                                                                                                                     | .08                                | .0015               |                  |                          |                  | 4:00a                              | .0027           | .1978            |
| 3-23                                                                                                                                                                     | .80                                | .0041               |                  |                          |                  | 12:00n                             | .0010           | .2130            |
| 3-24                                                                                                                                                                     | .03                                | .0397               | 4-3-58           | Rain Gages <sup>1/</sup> |                  |                                    |                 | 0                |
| 3-25                                                                                                                                                                     | .19                                | .0019               | 4:30p            | 0                        | 0                |                                    |                 |                  |
| 3-26                                                                                                                                                                     | .24                                | .0334               | :45              | .04                      | .01              |                                    |                 |                  |
| 3-27-28                                                                                                                                                                  | 0                                  | .0109               | 5:15             | .80                      | .41              |                                    |                 |                  |
| 3-29                                                                                                                                                                     | .05                                | .0021               | :30              | .20                      | .46              |                                    |                 |                  |
| 3-30                                                                                                                                                                     | .09                                | .0024               | :45              | .12                      | .49              |                                    |                 |                  |
| 3-31                                                                                                                                                                     | 0                                  | .0019               |                  |                          |                  |                                    |                 |                  |
| 4-1                                                                                                                                                                      | 0                                  | .0017               | 4-3-58           | Rain Gage 7              |                  |                                    |                 |                  |
| 4-2                                                                                                                                                                      | .03                                | .0014 <sup>3/</sup> |                  | (See page 62.9-2)        |                  |                                    |                 |                  |
| 4-3                                                                                                                                                                      | .82                                | .0440 <sup>3/</sup> |                  |                          |                  |                                    |                 |                  |
| Watershed Conditions: 20% of area<br>tilled for planting of cotton and<br>corn; 13% pasture, 39% idle,<br>23% woods - good cover; 3% urban;<br>2% bare gullies.          |                                    |                     |                  |                          |                  |                                    |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 22,990.                                                                                                            |                                    |                     |                  |                          |                  |                                    |                 |                  |
| 1/ Rain gages 4, 5, 6, 7, 8, 9, 13, and 15 Thiessen weighted.                                                                                                            |                                    |                     |                  |                          |                  |                                    |                 |                  |
| 2/ For storm rainfall for rain gages 4, 5, 8, and 13 see page 62.5-3.                                                                                                    |                                    |                     |                  |                          |                  |                                    |                 |                  |
| 3/ Runoff peaked at 2:15p at rate of .0184 in/hr with recessional flow to event.                                                                                         |                                    |                     |                  |                          |                  |                                    |                 |                  |

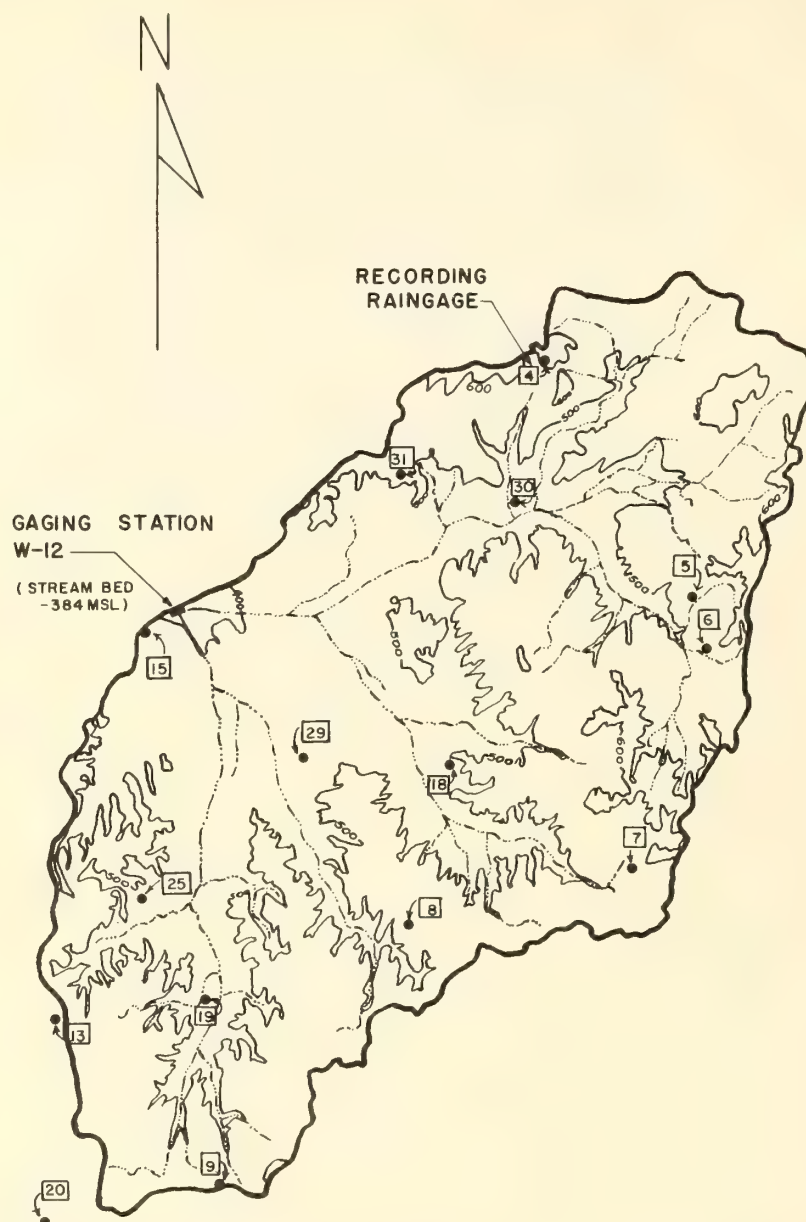


OXFORD, MISSISSIPPI WATERSHED W-12



OXFORD, MISSISSIPPI WATERSHED W-12





SCALE IN MILES

CONTOUR INTERVAL-100 FEET

NOTE: FOR WATERSHED LOCATION  
SEE FIGURE 1, PAGE 62.11-5

OXFORD, MISSISSIPPI

WATERSHED W-12

AREA: 22,800 ACRES

# OXFORD, MISSISSIPPI Watershed W-17<sup>1</sup>

LOCATION: Marshall Co., Miss.; 7.8 mi. SW of Holly Springs on County road; Pigeon Roost Creek Watershed, Yazoo River Basin.

AREA: 32,100 ac. (50.2 sq. mi.)

SHAPE: Leaf; 8.5 mi. wide, 6.5 mi. long.

SLOPES: 21% is in 0-2% class; 22% in 2-5%; 7% in 5-8%; 8% in 8-12%; 18% in 12-17%; 24% in 17% and above. Aspect W.

SOILS: Loessial and Coastal Plains; topsoil - 8% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 10% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 12% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 49% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 21% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 8% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 10% slow permeability, impeding layer at 15 to 20 ins.; 12% moderate to slow permeability, impeding layer at 15 to 20 ins.; 49% moderate to rapid permeability, no impeding layer; 21% moderate to moderately rapid permeability, no impeding layer. Internal drainage - medium to slow. Loring silt loam - 8%; Grenada silt loam - 10%; Providence silt loam and silty clay loam - 12%; Ruston fine sandy loam - 49%; Hymon loam - 21%.

EROSION: + - 21%; 2 - 16%; 3 - 63%.

LAND CAPABILITY: II - 22%; III - 8%; IV - 10%; VI - 11%; VII - 49%.

SURFACE DRAINAGE: Good; length of principal waterway - 8 mi.; main tributary (Jones Creek) - 5.5 mi. long; sand bed channels. Approximately 14% non-contributing area due to small desilting and retarding structures, increased to about 18% in 1960.

CHARACTER OF FLOW: Perennial, continuous.

INSTRUMENTATION: Runoff - current meter rated section at dredged sand-bottom channel; continuous water-stage recorder. Precipitation - 10 recording gages, increased to twenty recording gages, July, 1959.

WATERSHED CONDITIONS: Normally about 20% is in cultivation - cotton and corn, 42% idle - good to poor cover of broom sedge and common grasses, 13% pasture - good to fair cover; 21% woods - good to fair cover; 2% urban (town of Holly Springs); 2% bare gullies.

GENERAL REPRESENT: Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                           |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-17<br>(Area - 32,100 Acres) |          |       |       |      |        |       |        |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|-------------------------------------------------------------|----------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                                                       |                   | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July                                                        | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                                                                | P                 | 8.04 | 6.92                                      | 2.40 | 6.55    | 5.64 | 6.34    | 3.49                                                        | 1.39     | 6.51  | 3.54  | 9.29 | 4.93   | 65.04 |        |      |
|                                                                                                                                                                                                     | x                 | 2.78 | 1.54                                      | .29  | 1.25    | 1.31 | .65     | .34                                                         | .19      | .39   | .20   | 2.81 | 1.32   | 13.07 |        |      |
| 1958                                                                                                                                                                                                | P                 | 2.70 | 1.57                                      | 3.44 | 6.61    | 4.35 | 5.51    | 6.52                                                        | 1.21     | 9.41  | 0.95  | 3.38 | 1.63   | 47.28 |        |      |
|                                                                                                                                                                                                     | x                 | 0.47 | .27                                       | .44  | 1.23    | 1.21 | .37     | .57                                                         | .21      | 1.12  | .23   | .32  | .22    | 6.66  |        |      |
| 1959                                                                                                                                                                                                | P                 | 4.07 | 3.87                                      | 3.33 | 4.24    | 4.45 | 4.02    | 4.71                                                        | 5.50     | 2.71  | 2.21  | 3.23 | 6.77   | 49.11 |        |      |
|                                                                                                                                                                                                     | x                 | .94  | .95                                       | .53  | .72     | .46  | .73     | .42                                                         | .57      | .41   | .21   | .21  | 1.28   | 7.43  |        |      |
| Normal P                                                                                                                                                                                            |                   | 6.36 | 4.96                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17                                                        | 3.13     | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                             |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-17                          |          |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                                                                | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                                             |          |       |       |      |        |       |        |      |
|                                                                                                                                                                                                     |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                                             | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                                                     | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                                                        | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                                                                | 5-22              | 0.20 | 5-22                                      | 0.20 | 5-22    | 0.38 | 11-13   | 0.82                                                        | 11-13    | 0.98  | 1-31  | 1.39 | 1-31   | 1.96  | 1-28   | 2.99 |
| 1958                                                                                                                                                                                                | 9-19              | .09  | 9-19                                      | .08  | 9-19    | .16  | 5-1     | .34                                                         | 5-1      | .42   | 9-19  | .76  | 9-19   | .87   | 4-25   | 1.05 |
| 1959                                                                                                                                                                                                | 12-18             | .10  | 12-18                                     | .10  | 12-18   | .17  | 12-18   | .34                                                         | 12-18    | .39   | 6-10  | .46  | 12-16  | .62   | 12-11  | 1.00 |
| Notes: Quality of records: Q - good for 1957 and 1958, fair for 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss.<br>1/ Watershed 17A not included. |                   |      |                                           |      |         |      |         |                                                             |          |       |       |      |        |       |        |      |

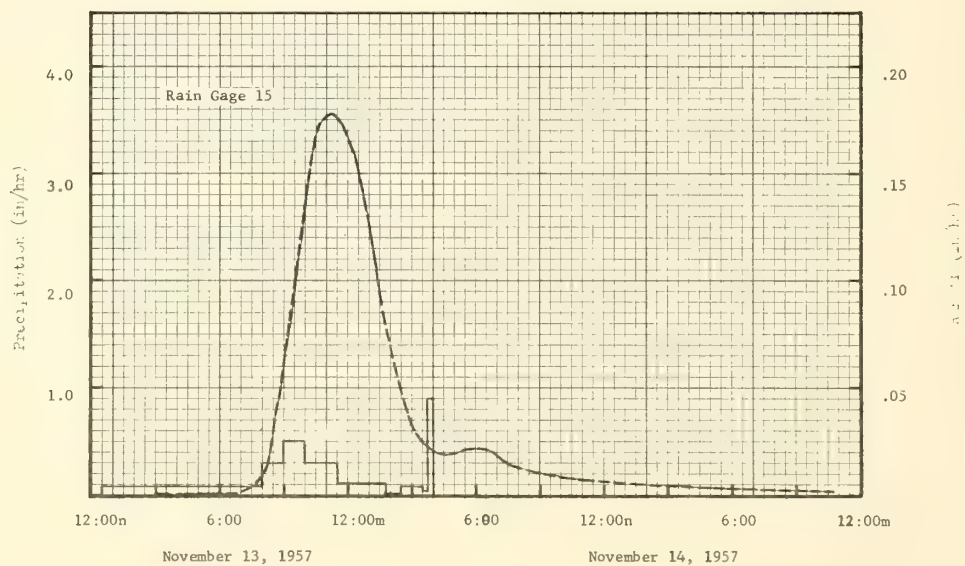
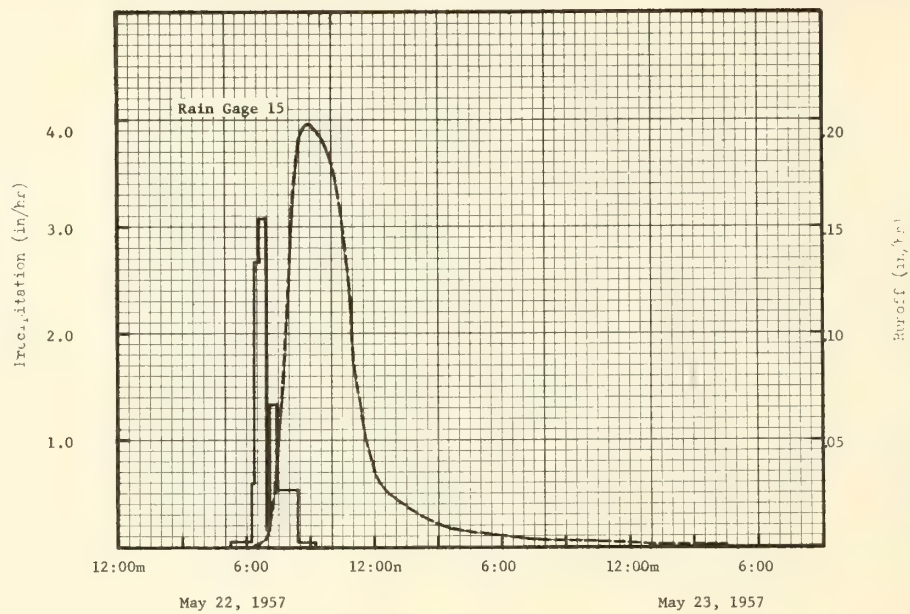
Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

| SELECTED RUNOFF EVENTS                                                                                                                                                                                    |                                    |                     |                  |                          | Oxford, Mississippi Watershed W-17 |                  |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------|------------------|--------------------------|------------------------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                     |                                    |                     | Rainfall         |                          |                                    | Runoff           |                 |                  |
| Date                                                                                                                                                                                                      | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches)  | Date and<br>time | Intensity<br>(in/hr)     | Acc.<br>(inches)                   | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of May 22, 1957                                                                                                                                                                                     |                                    |                     |                  |                          |                                    |                  |                 |                  |
| 4-23-57                                                                                                                                                                                                   | 0                                  | 0.0437              | 5-22-57          | Rain Gage 15             |                                    | 5-22-57          |                 |                  |
| 4-24                                                                                                                                                                                                      | 0                                  | .0089               | 12:15a           | 0                        | 0                                  | 5:15a            | .0003           | 0                |
| 4-25                                                                                                                                                                                                      | .76                                | .1393               | 5:15             | T                        | 0                                  | 6:45             | .0020           | .0008            |
| 4-26                                                                                                                                                                                                      | 0                                  | .0133               | 6:15             | .05                      | .05                                | 7:15             | .0195           | .0048            |
| 4-27                                                                                                                                                                                                      | 0                                  | .0070               | :20              | .60                      | .10                                | :45              | .0550           | .0309            |
| 4-28                                                                                                                                                                                                      | .04                                | .0055               | :35              | 2.68                     | .72                                | 8:15             | .1600           | .0953            |
| 4-29                                                                                                                                                                                                      | .36                                | .0207               | :55              | 3.09                     | 1.75                               | :30              | .1900           | .1406            |
| 4-30                                                                                                                                                                                                      | 0                                  | .0096               | 7:02             | .17                      | 1.77                               | :45              | .1965           | .1893            |
| 5-1                                                                                                                                                                                                       | .20                                | .0170               | :25              | 1.33                     | 2.53                               | 9:00             | .1990           | .2388            |
| 5-2                                                                                                                                                                                                       | .17                                | .0096               | 8:25             | .53                      | 2.81                               | :15              | .1950           | .2878            |
| 5-3                                                                                                                                                                                                       | 0                                  | .0089               | 9:15             | .04                      | 2.84                               | :45              | .1850           | .3837            |
| 5-4-8                                                                                                                                                                                                     | 0                                  | .0410               |                  |                          |                                    | 10:15            | .1650           | .4726            |
| 5-9-10                                                                                                                                                                                                    | 0                                  | .0148               | 5-22-57          | Rain Gages <sup>1/</sup> |                                    | :45              | .1255           | .5462            |
| 5-11-12                                                                                                                                                                                                   | 0                                  | .0140               | 4:00a            | 0                        | 0                                  | 11:15            | .0730           | .5940            |
| 5-13                                                                                                                                                                                                      | .16                                | .0070               | 5:00             | .01                      | .01                                | 12:00n           | .0370           | .6321            |
| 5-14                                                                                                                                                                                                      | .22                                | .0111               | 6:15             | .03                      | .05                                | 1:00p            | .0220           | .6596            |
| 5-15                                                                                                                                                                                                      | 0                                  | .0089               | :30              | 1.27                     | .37                                | 3:00             | .0100           | .6911            |
| 5-16                                                                                                                                                                                                      | .54                                | .0408               | :45              | 2.47                     | .99                                | 5:00             | .0060           | .7069            |
| 5-17                                                                                                                                                                                                      | T                                  | .0215               | 7:00             | 1.30                     | 1.31                               | 6:00             | .0055           | .7124            |
| 5-18                                                                                                                                                                                                      | .67                                | .0133               | :30              | 1.00                     | 1.81                               | 9:00             | .0022           | .7231            |
| 5-19                                                                                                                                                                                                      | .59                                | .0556               | 8:00             | .40                      | 2.01                               | 12:00m           | .0018           | .7297            |
| 5-20                                                                                                                                                                                                      | 0                                  | .0104               | 8:30             | .26                      | 2.14                               | 5-23-57          |                 |                  |
| 5-21                                                                                                                                                                                                      | 0                                  | .0082 <sup>2/</sup> | 9:00             | .01                      | 2.15                               | 3:00a            | .0013           | .7342            |
| 5-22                                                                                                                                                                                                      | 0                                  | .0015 <sup>2/</sup> |                  |                          |                                    | 6:00             | .0011           | .7378            |
| <u>Watershed Conditions:</u> 20% of area<br>under cultivation in cotton and<br>corn - poor to fair cover; 13%<br>pasture, 42% idle, 21% woods -<br>good cover; 2% urban; 2% bare<br>gullies.              |                                    |                     | 5-22-57          | Rain Gage 4              |                                    |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 7:15a            | 0                        | 0                                  |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 9:30             |                          | 2.27                               |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 5-22-57          | Rain Gage 5              |                                    |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 6:20a            | 0                        | 0                                  |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 8:35             |                          | 2.14                               |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 5-22-57          | Rain Gage 8              |                                    |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 6:30a            | 0                        | 0                                  |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 8:30             |                          | 1.36                               |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 5-22-57          | Rain Gage 13             |                                    |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 6:25a            | 0                        | 0                                  |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 8:25             |                          | 1.85                               |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 5-22-57          | Rain Gage 2              |                                    |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 4:55a            | 0                        | 0                                  |                  |                 |                  |
|                                                                                                                                                                                                           |                                    |                     | 8:20             |                          | 1.40                               |                  |                 |                  |
| <b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 32,367.<br><sup>1/</sup> Rain gages 2, 4, 5, 6, 7, 8, 9, 13, 14, and 15 Thiessen weighted.<br><sup>2/</sup> Base flow prior to runoff event. |                                    |                     |                  |                          |                                    |                  |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                                                                 |                                   |                    | Oxford, Mississippi Watershed W-17 |                         |                  |                  |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------|------------------------------------|-------------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                  |                                   |                    | Rainfall                           |                         |                  | Runoff           |                 |                  |
| Date                                                                                                                                                   | Rainfall <sup>1</sup><br>(inches) | Runoff<br>(inches) | Date and<br>time                   | Intensity<br>(in/hr)    | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of November 13-14, 1957                                                                                                                          |                                   |                    |                                    |                         |                  |                  |                 |                  |
| 10-9-57                                                                                                                                                | 0                                 | 0.0050             | 11-13-57                           | Rain Gage 15            |                  | 11-13-57         |                 |                  |
| 10-10-11                                                                                                                                               | 0                                 | .0047              | 12:30p                             | 0                       |                  | 3:00p            | .0003           | 0                |
| 10-12-14                                                                                                                                               | 0                                 | .0135              | 5:15                               | .07                     | .35              | 6:00             | .0009           | .0015            |
| 10-15                                                                                                                                                  | .19                               | .0047              | 8:00                               | .29                     | 1.15             | 7:00             | .0021           | .0026            |
| 10-16                                                                                                                                                  | .42                               | .0059              | 9:00                               | .50                     | 1.65             | :30              | .0045           | .0040            |
| 10-17-21                                                                                                                                               | 0                                 | .0265              | 10:00                              | .30                     | 1.95             | 8:15             | .0174           | .0104            |
| 10-22                                                                                                                                                  | .64                               | .0059              | 11:30                              | .11                     | 2.12             | 9:00             | .0615           | .0391            |
| 10-23                                                                                                                                                  | .85                               | .0082              | 11-14-57                           |                         |                  | 10:00            | .1358           | .1354            |
| 10-24                                                                                                                                                  | 0                                 | .0059              | 1:45a                              | .01                     | 2.15             | :30              | .1664           | .2125            |
| 10-25-27                                                                                                                                               | 0                                 | .0159              | 2:30                               | .08                     | 2.21             | 11:00            | .1765           | .2992            |
| 10-28                                                                                                                                                  | .01                               | .0053              | 3:30                               | .04                     | 2.25             | :15              | .1778           | .3436            |
| 10-29                                                                                                                                                  | .17                               | .0056              | 4:00                               | .20                     | 2.30             | :30              | .1755           | .3875            |
| 10-30                                                                                                                                                  | .24                               | .0059              | 55                                 | .90                     | 2.45             | 12:00m           | .1671           | .4747            |
| 10-31                                                                                                                                                  | .01                               | .0056              |                                    |                         |                  | 11-14-57         |                 |                  |
| 11-1-2                                                                                                                                                 | 0                                 | .0112              | 11-13-57                           | Rain Gages <sup>1</sup> |                  | 1:00a            | .1241           | .6243            |
| 11-3                                                                                                                                                   | .17                               | .0056              | 12:00n                             | 0                       |                  | 2:00             | .0686           | .7192            |
| 11-4-5                                                                                                                                                 | 0                                 | .0112              | 1:00p                              | .02                     | .02              | 3:00             | .0310           | .7674            |
| 11-6                                                                                                                                                   | 0                                 | .0059              | :30                                | .14                     | .09              | 4:00             | .0195           | .7918            |
| 11-7                                                                                                                                                   | 1.64                              | .0370              | 2:30                               | .09                     | .18              | 5:00             | .0195           | .8104            |
| 11-8                                                                                                                                                   | .41                               | .2260              | 3:30                               | .05                     | .23              | 6:00             | .0220           | .8322            |
| 11-9                                                                                                                                                   | 0                                 | .0119              | 4:30                               | .08                     | .31              | 7:00             | .0178           | .8535            |
| 11-10                                                                                                                                                  | 0                                 | .0096              | 5:30                               | .11                     | .42              | 8:00             | .0120           | .8684            |
| 11-11                                                                                                                                                  | 0                                 | .0089              | 6:00                               | .20                     | .52              | 10:00            | .0085           | .8888            |
| 11-12                                                                                                                                                  | .42                               | .0082              | :30                                | .29                     | .66              | 12:00n           | .0064           | .9030            |
| 11-13                                                                                                                                                  |                                   | .0045 <sup>2</sup> | 8:00                               | .36                     | 1.20             | 3:00p            | .0045           | .9192            |
| Watershed conditions: 20% of area in bottom land residue - fair cover; 13% pasture, 42% idle, 21% woods - good to fair cover, 2% urban, 2% bare hills. |                                   |                    | :30                                | .56                     | 1.48             | 6:00             | .0030           | .9303            |
|                                                                                                                                                        |                                   |                    | 9:00                               | .65                     | 1.80             | 9:00             | .0020           | .9378            |
|                                                                                                                                                        |                                   |                    | :30                                | .47                     | 2.04             | 12:00m           | .0016           | .9432            |
|                                                                                                                                                        |                                   |                    | 10:00                              | .28                     | 2.18             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | :30                                | .18                     | 2.27             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11:30                              | .12                     | 2.39             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-14-57                           |                         |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 2:00a                              | .05                     | 2.45             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 3:00                               | .12                     | 2.57             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 4:00                               | .18                     | 2.75             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 5:00                               |                         | 2.75             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-13-57                           | Rain Gage 4             |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 1:00p                              | 0                       | 0                |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-14-57                           |                         |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 4:00a                              |                         | 2.59             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-13-57                           | Rain Gage 5             |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 12:45p                             | 0                       | 0                |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-14-57                           |                         |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 4:05a                              |                         | 2.66             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-13-57                           | Rain Gage 8             |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 12:30p                             | 0                       | 0                |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-14-57                           |                         |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 4:05a                              |                         | 2.96             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-13-57                           | Rain Gage 13            |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 12:45p                             | 0                       |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-14-57                           |                         |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 4:00a                              |                         | 2.80             |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-13-57                           | Rain Gage 2             |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 12:55p                             | 0                       | 0                |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 11-14-57                           |                         |                  |                  |                 |                  |
|                                                                                                                                                        |                                   |                    | 4:00a                              |                         | 2.40             |                  |                 |                  |

Notes: To convert runoff in in/hr to cfs, multiply by 32,367.  
<sup>1</sup>/ Rain gages 2, 4, 5, 6, 7, 8, 9, 13, 14, and 15 Thiessen weighted.  
<sup>2</sup> Base flow prior to runoff event.





OXFORD, MISSISSIPPI WATERSHED W-17



OXFORD, MISSISSIPPI Watershed W-19

LOCATION: Marshall Co., Miss.; 7.6 mi. SW. of Holly Springs on county road; Slayden Creek, Pigeon Roost Creek Watershed, Yazoo River Basin.

AREA: 243 ac.

SHAPE: Rectangular; 2,600 ft. wide, 4,000 ft. long.

SLOPES: 9% is in 0-2% class; 3% in 2-5%; 4% in 5-8%; 5% in 8-12%; 65% in 12-17%; 14% in 17% and above. Aspect E.

SOILS: Loessial and Coastal Plains; topsoil - 4% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 8% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 12% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 67% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 9% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 4% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 8% slow permeability, impeding layer at 15 to 20 ins.; 12% moderate to slow permeability, impeding layer at 15 to 20 ins.; 67% moderate to rapid permeability, no impeding layer; 9% moderate to moderately rapid permeability, no impeding layer. Internal drainage - medium to slow. Loring silt loam - 4%; Grenada silt loam - 8%; Providence silt loam and silty clay loam - 12%; Ruston fine sandy loam - 67%; Hymon loam - 9%.

EROSION: + - 9%; 2 - 20%; 3 - 71%.

LAND CAPABILITY: II - 9%; III - 5%; IV - 7%; VI - 21%; VII - 58%.

SURFACE DRAINAGE: Good; length of principal waterway - .75 mi.; sand bed channel.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff - current meter rated section of natural sand-bottom channel; continuous water-stage recorder. Precipitation - one recording gage.

WATERSHED CONDITIONS: Normally about 2% is in cultivation - cotton and corn, 64% idle - fair to poor cover of broom sedge and common grasses, 4% pasture - fair cover; 29% woods - good to fair cover; 1% bare gullies.

GENERALLY REPRESENTS: Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                         |                      |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-19<br>(Area - 243 Acres) |          |       |       |      |        |       |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------|-------------------------------------------|------|---------|------|---------|----------------------------------------------------------|----------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                     |                      | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July                                                     | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                              | P                    | 7.70 | 7.53                                      | 1.98 | 6.02    | 5.50 | 7.20    | 2.57                                                     | 1.56     | 8.24  | 3.23  | 9.36 | 5.55   | 66.44 |        |      |
|                                                                                                                                                                   | Q                    | 2.16 | 2.10                                      | .03  | .69     | .79  | .90     | .19                                                      | 0        | .70   | .02   | 2.16 | 1.19   | 10.93 |        |      |
| 1958                                                                                                                                                              | P                    | 2.42 | 1.64                                      | 3.11 | 6.98    | 4.31 | 6.81    | 7.07                                                     | 1.41     | 12.92 | 0.83  | 3.21 | 1.79   | 52.50 |        |      |
|                                                                                                                                                                   | Q                    | 0.07 | .02                                       | .02  | 1.20    | .77  | .26     | .27                                                      | .01      | 2.47  | 0     | 0    | 0      | 5.09  |        |      |
| 1959                                                                                                                                                              | P                    | 4.44 | 4.13                                      | 3.34 | 3.60    | 2.70 | 2.61    | 4.64                                                     | 4.61     | 1.01  | 2.02  | 2.64 | 6.49   | 42.23 |        |      |
|                                                                                                                                                                   | Q                    | .74  | .57                                       | .16  | .06     | 0    | .01     | .06                                                      | .17      | 0     | 0     | .01  | .17    | 1.95  |        |      |
| Normal                                                                                                                                                            | P                    | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17                                                     | 3.13     | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                        |                      |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-19                       |          |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                              | MAXIMUM<br>DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                                          |          |       |       |      |        |       |        |      |
|                                                                                                                                                                   |                      |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                                          | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                   | Date                 | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                                                     | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                              | 11-18                | 0.31 | 11-18                                     | 0.25 | 11-18   | 0.38 | 11-13   | 0.61                                                     | 11-13    | 0.71  | 1-31  | 1.16 | 1-30   | 1.83  | 1-28   | 3.23 |
| 1958                                                                                                                                                              | 9-19                 | 1.05 | 9-19                                      | .66  | 9-19    | .88  | 9-19    | 1.10                                                     | 9-19     | 1.18  | 9-19  | 1.79 | 9-19   | 2.14  | 9-19   | 2.19 |
| 1959                                                                                                                                                              | 1-21                 | .15  | 1-21                                      | .13  | 1-21    | .20  | 1-21    | .27                                                      | 1-21     | .31   | 1-21  | .33  | 2-13   | .37   | 1-15   | .65  |
| Notes: Quality of records: Q - fair for 1957 and 1958, fair for 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss. |                      |      |                                           |      |         |      |         |                                                          |          |       |       |      |        |       |        |      |

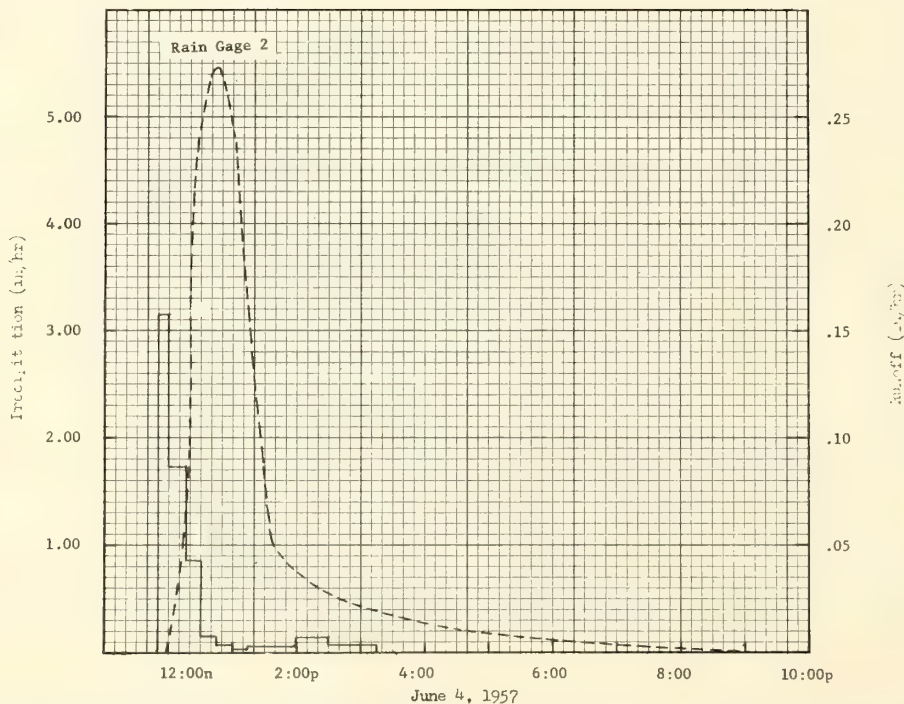
Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

| SELECTED RUNOFF EVENTS                                                                                                                                   |                      |                    | Oxford, Mississippi Watershed W-19 |                      |                  |                  |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                    |                      |                    | Rainfall                           |                      |                  | Runoff           |                 |                  |
| Date                                                                                                                                                     | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                   | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 4, 1957                                                                                                                                    |                      |                    |                                    |                      |                  |                  |                 |                  |
| 5-4-57                                                                                                                                                   | 0                    | 0                  | 6-4-57                             | Rain Gage 2          |                  | 6-4-57           |                 |                  |
| 5-5-12                                                                                                                                                   | 0                    | 0                  | 11 50a                             | 0                    |                  | 12 00a           | 0               |                  |
| 5-13                                                                                                                                                     | .15                  | 0                  | 12 00a                             | 3.12                 | .52              | 12 00p           | .0286           | .0012            |
| 5-14                                                                                                                                                     | 1.30                 | .2449              | 1 15p                              | 1.72                 | .95              | 1 10             | .0400           | .0041            |
| 5-15                                                                                                                                                     | 0                    | 0                  | 3 30                               | .84                  | 1.16             | 1 15             | .0571           | .0082            |
| 5-16                                                                                                                                                     | .15                  | 0                  | 4 45                               | .16                  | 1.20             | 1 20             | .1306           | .0160            |
| 5-17                                                                                                                                                     | 0                    | 0                  | 1 00                               | .08                  | 1.22             | 1 25             | .2285           | .0310            |
| 5-18                                                                                                                                                     | .35                  | 0                  | 1 15                               | .04                  | 1.23             | 1 35             | .2612           | .0718            |
| 5-19                                                                                                                                                     |                      | .0490              | 2 00                               | .08                  | 1.29             | 1 45             | .2734           | .1165            |
| 5-20-21                                                                                                                                                  |                      |                    | 3 30                               | .12                  | 1.35             | 1 55             | .2612           | .1612            |
| 5-22                                                                                                                                                     | 1.40                 | .2938              | 3 15                               | .08                  | 1.41             | 1 05             | .2285           | .2019            |
| 5-23                                                                                                                                                     | .65                  | .0882              |                                    |                      |                  | 1 15             | .1632           | .2342            |
| 5-24                                                                                                                                                     | .27                  | .1175              |                                    |                      |                  | 1 30             | .0816           | .2659            |
| 5-25                                                                                                                                                     | .04                  |                    |                                    |                      |                  | 1 45             | .0449           | .2803            |
| 5-26                                                                                                                                                     | .21                  |                    |                                    |                      |                  | 2 30             | .0286           | .3035            |
| 5-27-31                                                                                                                                                  | 0                    | 0                  |                                    |                      |                  | 3 30             | .0171           | .3256            |
| 6-1                                                                                                                                                      | 0                    |                    |                                    |                      |                  | 6 15             | .0053           | .3564            |
| 6-2                                                                                                                                                      | .35                  |                    |                                    |                      |                  | 8 30             | .0012           | .3638            |
| 6-3                                                                                                                                                      | .57                  |                    |                                    |                      |                  | 12 00m           | .0008           | .3673            |
|                                                                                                                                                          |                      |                    |                                    |                      |                  | 6-5-57           |                 |                  |
|                                                                                                                                                          |                      |                    |                                    |                      |                  | 2 15a            | .0004           | .3687            |
| Watershed Conditions: 2% of area under cultivation in cotton and corn - poor to fair cover; 4% pasture; 64% idle, 29% woods - good cover; 1% bare hills. |                      |                    |                                    |                      |                  |                  |                 |                  |
| Event of July 12, 1958                                                                                                                                   |                      |                    |                                    |                      |                  |                  |                 |                  |
| 6-12-58                                                                                                                                                  | 0                    | 0                  | 7-12-58                            | Rain Gage 2          |                  | 7-12-58          |                 |                  |
| 6-13-14                                                                                                                                                  | 0                    | 0                  | 11 30a                             | 0                    |                  | 11 07a           | 0               |                  |
| 6-15                                                                                                                                                     | .80                  | 0                  | 1 10                               | 3.00                 | .25              | 1 12             | .0001           | .0000            |
| 6-16                                                                                                                                                     | .07                  | 0                  | 1 20                               | .30                  | .30              | 1 20             | .0122           | .0008            |
| 6-17-18                                                                                                                                                  | 0                    | 0                  | 1 25                               | 2.40                 | .50              | 1 30             | .0106           | .0027            |
| 6-19                                                                                                                                                     | .18                  |                    | 1 40                               | .36                  | .59              | 1 45             | .0216           | .0067            |
| 6-20                                                                                                                                                     | 1.05                 | .0098              | 1 45                               | 2.52                 | .80              | 1 50             | .0490           | .0096            |
| 6-21-24                                                                                                                                                  | 0                    | 0                  | 1 50                               | .24                  | .82              | 1 55             | .0653           | .0144            |
| 6-25                                                                                                                                                     | 1.73                 | .0882              | 12 00n                             | 1.08                 | 1.00             | 12 00n           | .0673           | .0199            |
| 6-26                                                                                                                                                     | .70                  | .1567              |                                    |                      |                  | 1 15p            | .0898           | .0396            |
| 6-27-30                                                                                                                                                  | 0                    |                    |                                    |                      |                  | 1 25             | .0857           | .0542            |
| 7-1-5                                                                                                                                                    | 0                    | 0                  |                                    |                      |                  | 1 35             | .1061           | .0703            |
| 7-6                                                                                                                                                      | .33                  | 0                  |                                    |                      |                  | 1 50             | .1020           | .0963            |
| 7-7                                                                                                                                                      | .33                  | 0                  |                                    |                      |                  | 1 55             | .0898           | .1043            |
| 7-8                                                                                                                                                      | .84                  | 0                  |                                    |                      |                  | 1 15             | .0531           | .1273            |
| 7-9-11                                                                                                                                                   |                      |                    |                                    |                      |                  | 1 45             | .0216           | .1466            |
| 7-12                                                                                                                                                     | .73                  | .0348              |                                    |                      |                  | 2 45             | .0090           | .1621            |
|                                                                                                                                                          |                      |                    |                                    |                      |                  | 3 00             | .0008           | .1731            |
|                                                                                                                                                          |                      |                    |                                    |                      |                  | 3 30             |                 | .1741            |
| Watershed Conditions: 2% of area under cultivation in cotton and corn - fair to good cover; 4% pasture; 64% idle, 29% woods - good cover; 1% idle.       |                      |                    |                                    |                      |                  |                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 245.0.                                                                                             |                      |                    |                                    |                      |                  |                  |                 |                  |
| 1/ Rainfall 3:20a to 7:15a.                                                                                                                              |                      |                    |                                    |                      |                  |                  |                 |                  |
| 2/ Runoff 4:00 to 11:07a.                                                                                                                                |                      |                    |                                    |                      |                  |                  |                 |                  |

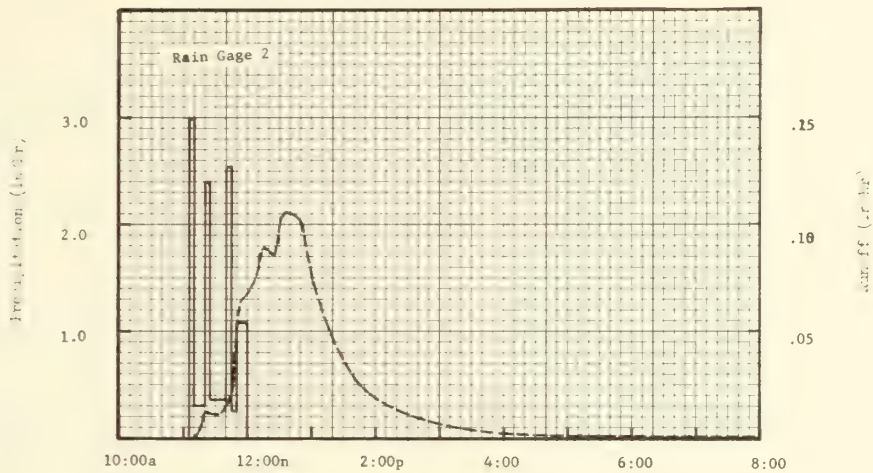


| SELECTED RUNOFF EVENTS      |                   |                 |               |                   |               | Oxford, Mississippi Watershed W-19 |              |               |
|-----------------------------|-------------------|-----------------|---------------|-------------------|---------------|------------------------------------|--------------|---------------|
| Antecedent conditions       |                   |                 | Rainfall      |                   |               | Runoff                             |              |               |
| Date                        | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                      | Rate (in/hr) | Acc. (inches) |
| Event of August 24-25, 1959 |                   |                 |               |                   |               |                                    |              |               |
| 7-20-59                     | 0.65              | 0               | 8-24-59       | Rain Gage 2       |               | 8-24-59                            |              |               |
| 7-21                        | .20               | 0               | 10:22p        | 0                 | 0             | 10:30p                             | 0            | 0             |
| 7-22                        | .10               | 0               | :29           | 3.86              | .45           | :40                                | .0159        | .0013         |
| 7-23                        | .20               | 0               | :32           | 2.00              | .55           | :45                                | .0171        | .0027         |
| 7-24                        | 1.10              | 0.0587          | :38           | 4.00              | .95           | :55                                | .1020        | .0126         |
| 7-25                        | .37               | 0               | :46           | 1.28              | 1.12          | 11:00                              | .1347        | .0225         |
| 7-26                        | 0                 | 0               |               |                   |               | :05                                | .1469        | .0344         |
| 7-27                        | .13               | 0               |               |                   |               | :15                                | .1143        | .0567         |
| 7-28-30                     | 0                 | 0               |               |                   |               | :20                                | .0857        | .0650         |
| 7-31                        | .11               | 0               |               |                   |               | :25                                | .0735        | .0716         |
| 8-1-5                       | 0                 | 0               |               |                   |               | :35                                | .0732        | .0838         |
| 8-6                         | .39               | 0               |               |                   |               | :45                                | .0571        | .0948         |
| 8-7-12                      | 0                 | 0               |               |                   |               | 12:00m                             | .0278        | .1038         |
| 8-13                        | .02               | 0               |               |                   |               | 8-25-59                            |              |               |
| 8-14-17                     | 0                 | 0               |               |                   |               | :30a                               | .0082        | .1113         |
| 8-18                        | .74 <sup>1/</sup> | .0018           |               |                   |               | 1:45                               | .0008        | .1158         |
| 8-19                        | .06               | .0095           |               |                   |               | 4:30                               | .0001        | .1169         |
| 8-20                        | 0                 | 0               |               |                   |               | 8:30                               | .0000        | .1171         |
| 8-21                        | .56               | 0               |               |                   |               | 12:00n                             | 0            | .1172         |
| 8-22                        | .13               | 0               |               |                   |               |                                    |              |               |
| 8-23                        | 0                 | 0               |               |                   |               |                                    |              |               |
| 8-24                        | .39               | 0               |               |                   |               |                                    |              |               |

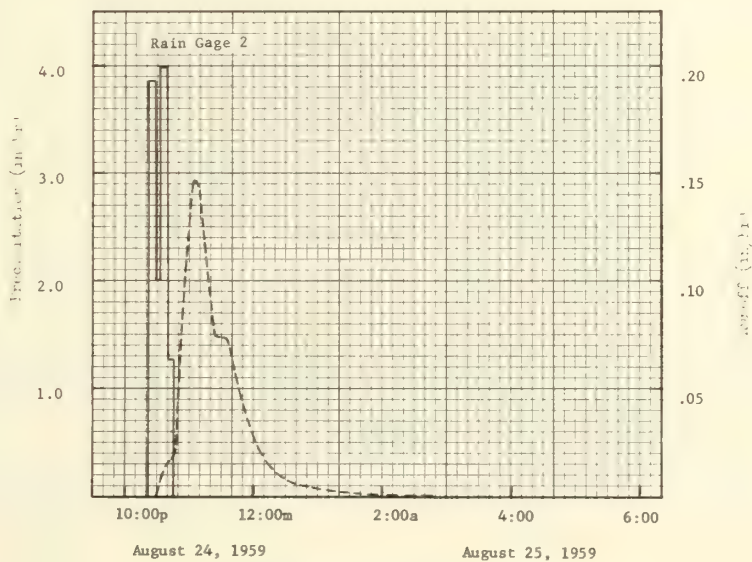
Watershed Conditions: 2% of area under cultivation in cotton and corn - good to fair cover; 4% pasture, 64% idle, 29% woods - good cover; 1% bare gullies.



Notes: To convert runoff in in/hr to cfs, multiply by 245.0.  
<sup>1/</sup> Rainfall of 0.5 in. 11:30-11:55p.



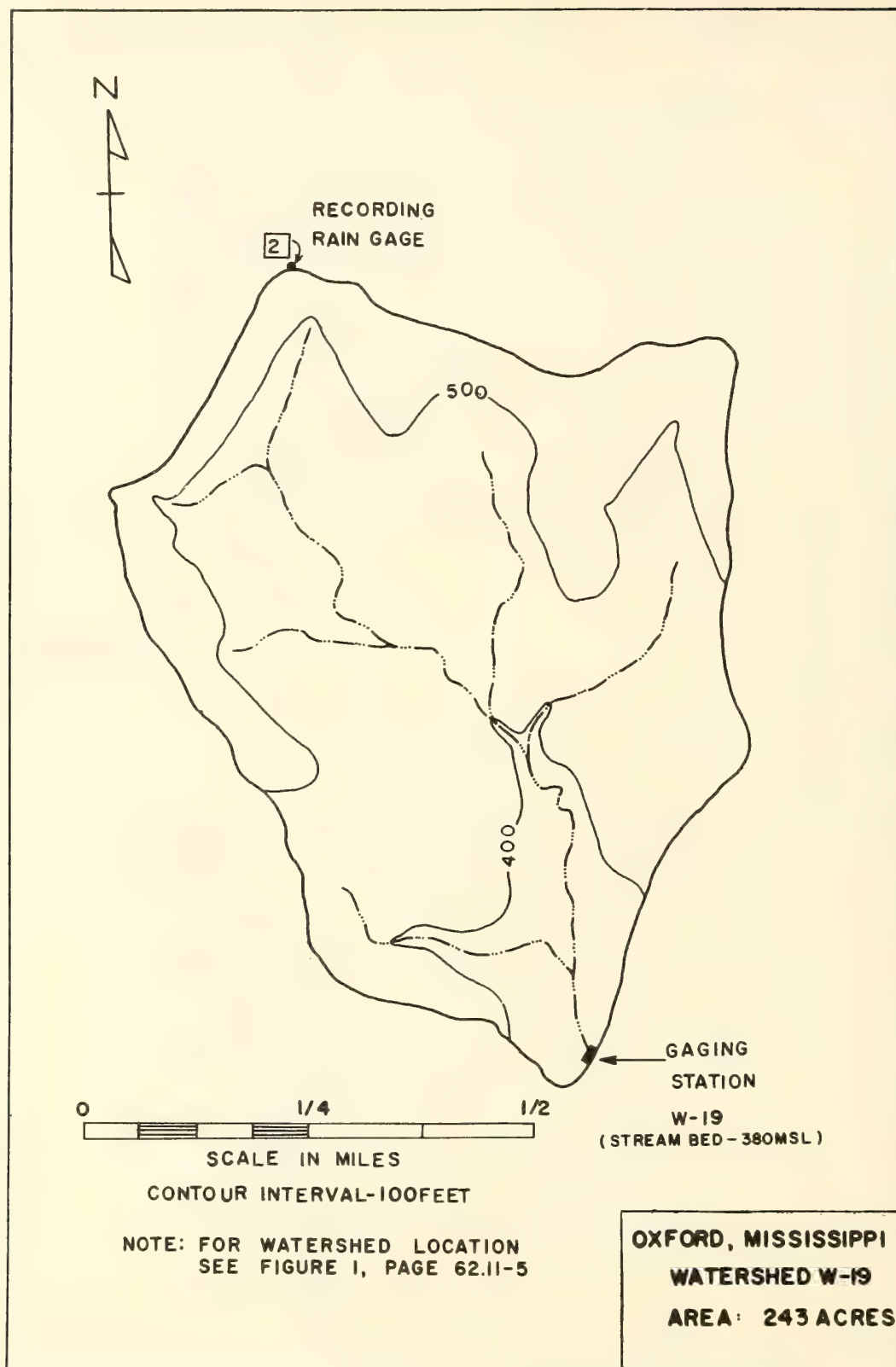
July 12, 1958



August 24, 1959

August 25, 1959

OXFORD, MISSISSIPPI WATERSHED W-19



OXFORD, MISSISSIPPI Watershed W-24

LOCATION: Marshall Co., Miss.; 2.2 mi. SW. of Holly Springs on county road; Little Sand Ditch, Pigeon Roost Creek Watershed, Yazoo River Basin.

AREA: 511 ac.

SHAPE: Triangular; base 6,900 ft., altitude 6,300 ft.

SLOPES: 10% is in 0-2% class; 7% in 2-5%; 12% in 5-8%; 8% in 8-12%; 11% in 12-17%; 52% in 17% and above. Aspect S.

SOILS: Loessial and Coastal Plains; topsoil - 6% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 13% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 13% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 64% fine sandy loam in texture, 0 to 10 ins. in depth, weak fine granular structure; 10% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 6% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 7% slow permeability, impeding layer at 15 to 20 ins.; 64% moderate to rapid permeability, no impeding layer; 10% moderate to moderately rapid permeability, no impeding layer. Internal drainage - medium to slow. Loring silt loam - 6%; Grenada silt loam - 7%; Providence silt loam and silty clay loam - 13%; Ruston fine sandy loam - 64%; Hymon loam - 10%.

EROSION: + - 10%; 1 - 10%; 2 - 14%; 3 - 66%.

LAND CAPABILITY: II - 12%, III - 4%, IV - 8%, VI - 7%, VII - 64%.

SURFACE DRAINAGE: Good, length of principal waterway - 1.25 mi; sand bed channel. About 6 non-contributing area due to small desilting and retention dams.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff - current meter rated section of natural sand-bottom channel, continuous water-stage recorder. Precipitation - one recording gage, increased to three recording gages, July, 1959.

WATERSHED CONDITIONS: Normally about 3% is in cultivation - cotton and corn, 32% idle - good to fair cover of broken sedge and common grasses, 3% pasture - good cover, 54% woods - good to fair cover, 3% bare gullies.

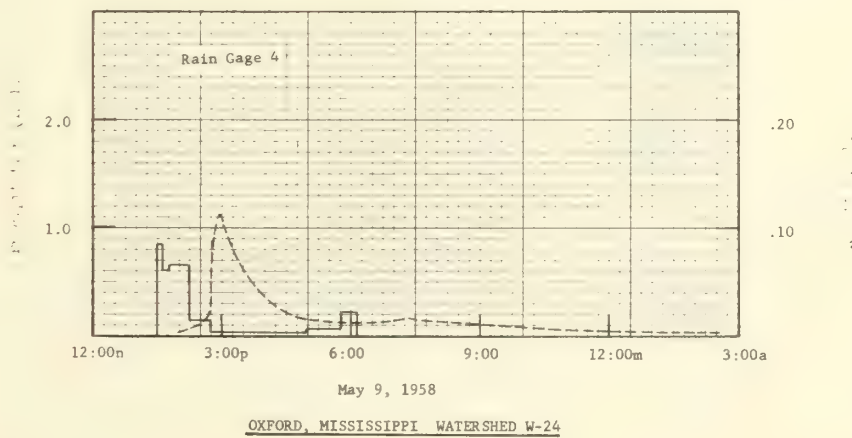
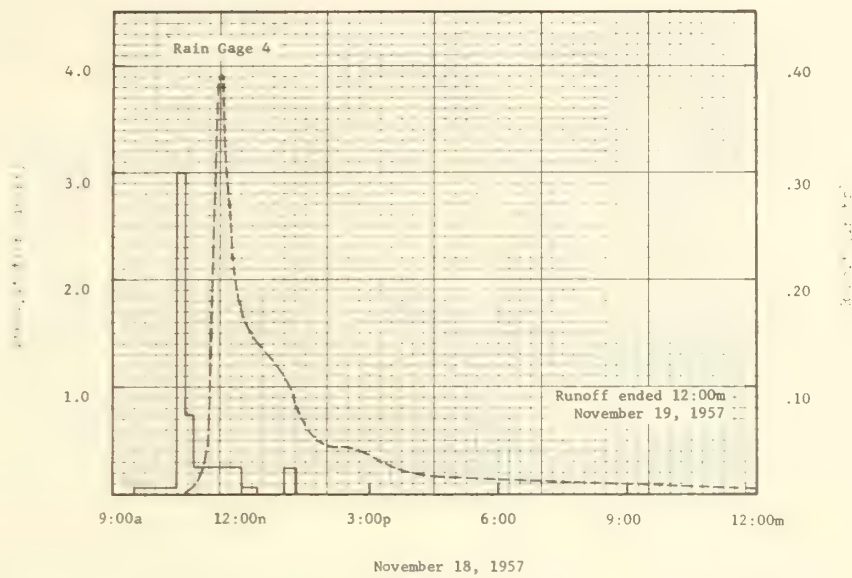
GENERAL REPRESENTS: Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

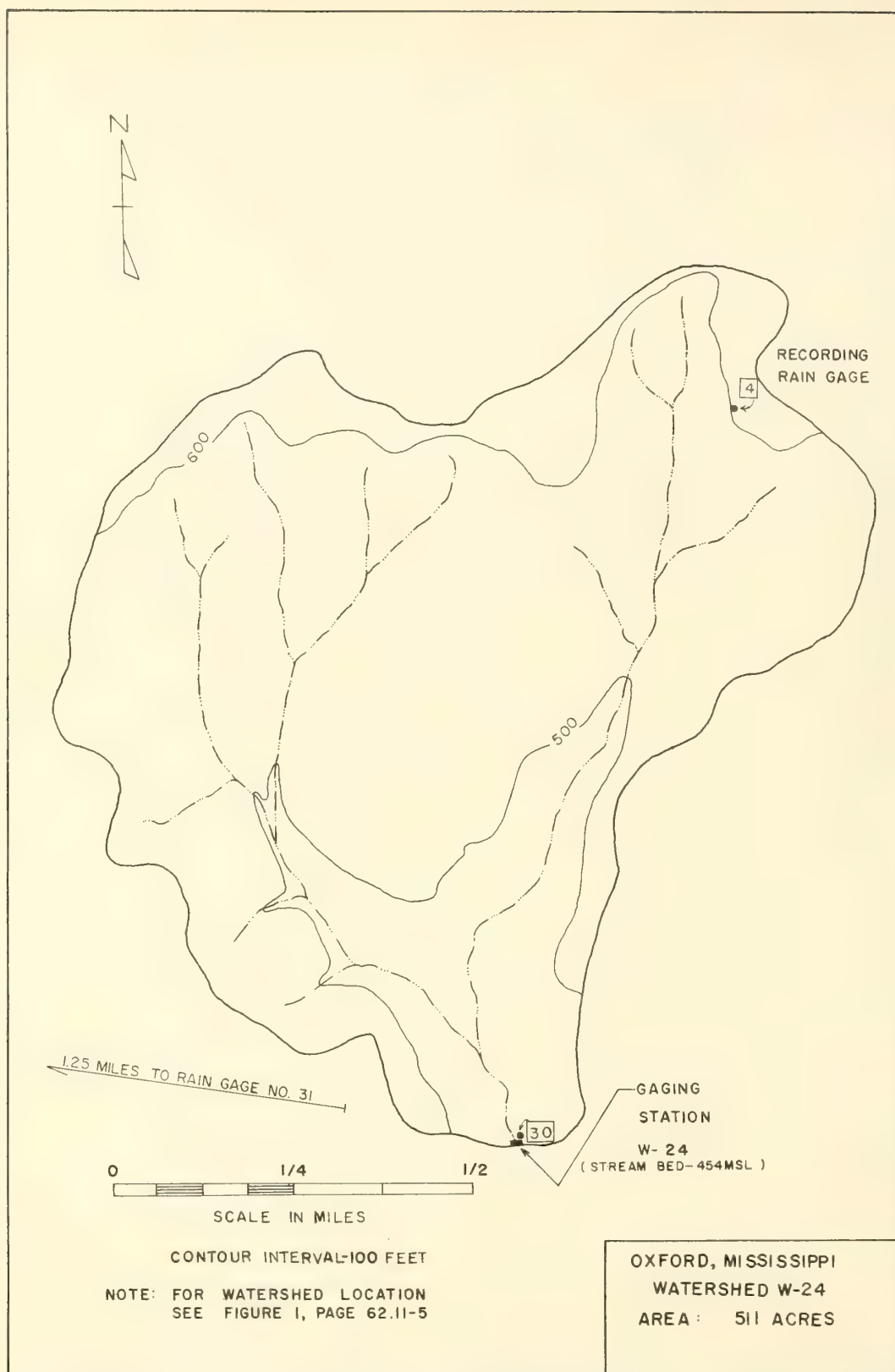
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                            |                      |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-24<br>(Area - 511 Acres) |          |       |       |      |        |       |        |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------|-------------------------------------------|------|---------|------|---------|----------------------------------------------------------|----------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                        |                      | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July                                                     | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                                 | P                    | 7.79 | 7.56                                      | 2.67 | 6.11    | 5.38 | 5.00    | 3.59                                                     | 0.82     | 6.70  | 3.82  | 8.97 | 4.88   | 63.29 |        |      |
|                                                                                                                                                                      | Q                    | 2.90 | 2.78                                      | .21  | 1.50    | 1.06 | .07     | .09                                                      | 0        | .30   | .09   | 2.68 | 1.45   | 13.13 |        |      |
| 1958                                                                                                                                                                 | P                    | 2.91 | 1.64                                      | 3.31 | 6.54    | 4.71 | 5.53    | 6.55                                                     | 2.00     | 8.60  | 0.94  | 3.68 | 1.72   | 48.13 |        |      |
|                                                                                                                                                                      | Q                    | 0.54 | .05                                       | .29  | 1.44    | 1.33 | .20     | .27                                                      | .09      | .79   | 0     | .28  | .05    | 5.33  |        |      |
| 1959                                                                                                                                                                 | P                    | 3.88 | 3.76                                      | 3.12 | 3.82    | 5.09 | 4.05    | 4.67                                                     | 5.54     | 2.99  | 2.17  | 3.14 | 6.89   | 49.12 |        |      |
|                                                                                                                                                                      | Q                    | .88  | .86                                       | .41  | .57     | .19  | .54     | .11                                                      | .20      | .13   | .02   | .02  | 1.13   | 5.06  |        |      |
| Normal                                                                                                                                                               | P                    | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17                                                     | 3.13     | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                           |                      |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-24                       |          |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                                 | MAXIMUM<br>DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                                          |          |       |       |      |        |       |        |      |
|                                                                                                                                                                      |                      |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                                          | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                      | Date                 | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                                                     | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                                 | 5-22                 | 0.79 | 5-22                                      | 0.60 | 5-22    | 0.82 | 5-22    | 0.92                                                     | 1-31     | 1.19  | 1-31  | 2.08 | 1-30   | 3.16  | 1-28   | 4.37 |
| 1958                                                                                                                                                                 | 8-23                 | .12  | 9-19                                      | .08  | 9-19    | .14  | 9-19    | .21                                                      | 9-19     | .33   | 9-19  | .59  | 9-19   | .68   | 4-25   | 1.50 |
| 1959                                                                                                                                                                 | 12-18                | .15  | 12-18                                     | .13  | 12-18   | .21  | 12-18   | .38                                                      | 12-18    | .44   | 12-18 | .46  | 12-17  | .62   | 12-11  | .98  |
| Notes: Quality of records: Q - fair in 1957, good in 1958, good in 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss. |                      |      |                                           |      |         |      |         |                                                          |          |       |       |      |        |       |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.



| SELECTED RUNOFF EVENTS                                                                                                                             |                      |                    |                  |                      |                  | Oxford, Mississippi Watershed W-24 |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                              |                      |                    | Rainfall         |                      |                  | Runoff                             |                 |                  |
| Date                                                                                                                                               | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of November 18, 1957                                                                                                                         |                      |                    |                  |                      |                  |                                    |                 |                  |
| 10-16-57                                                                                                                                           | 0.49                 | 0                  | 11-18-57         | Rain Gage 4          |                  | 11-18-57                           |                 |                  |
| 10-17-22                                                                                                                                           | 0                    | 0                  | 9:30a            | 0                    | 0                | 10:45a                             | 0               | 0                |
| 10-23                                                                                                                                              | 1.24                 | 0                  | 10:30            | .05                  | .05              | 11:00                              | .0107           | .0027            |
| 10-24-29                                                                                                                                           | 0                    | 0                  | :40              | 3.00                 | .55              | :15                                | .0660           | .0192            |
| 10-30                                                                                                                                              | .33                  | 0                  | :55              | .72                  | .73              | :30                                | .3919           | .1172            |
| 10-31                                                                                                                                              | 0                    | 0                  | 12:00n           | .25                  | 1.00             | :45                                | .2580           | .1817            |
| 11-1-2                                                                                                                                             | 0                    | 0                  | :25p             | .07                  | 1.03             | 12:00n                             | .1765           | .2258            |
| 11-3                                                                                                                                               | .12                  | 0                  | 1:00             | 0                    | 1.03             | :30 p                              | .1397           | .2957            |
| 11-4-6                                                                                                                                             | 0                    | 0                  | :20              | .21                  | 1.10             | 1:00                               | .1106           | .3510            |
| 11-7-8                                                                                                                                             | 2.06                 | .2976              |                  |                      |                  | :30                                | .0689           | .3854            |
| 11-9-11                                                                                                                                            | 0                    | 0                  |                  |                      |                  | 2:05                               | .0415           | .4176            |
| 11-12                                                                                                                                              | .37                  | 0                  |                  |                      |                  | :30                                | .0452           | .4357            |
| 11-13-14                                                                                                                                           | 2.59                 | .9951              |                  |                      |                  | 3:00                               | .0361           | .4560            |
| 11-15                                                                                                                                              | 0                    | .0418              |                  |                      |                  | 4:00                               | .0199           | .4840            |
| 11-16                                                                                                                                              | .07                  | .0046              |                  |                      |                  | 6:00                               | .0117           | .5156            |
| 11-17                                                                                                                                              | .24                  | .1674              |                  |                      |                  | 12:00m                             | .0036           | .5618            |
| 11-18                                                                                                                                              | 0                    | .0367 <sup>1</sup> |                  |                      |                  | 11-19-57                           |                 |                  |
| Watershed Conditions: 3% of area in cotton and corn residue - fair cover; 3% pasture, 32% idle, 59% woods - fair cover; 3% bare gullies.           |                      |                    |                  |                      |                  | 6:00a                              | .0029           | .5816            |
| Event of May 9, 1958                                                                                                                               |                      |                    |                  |                      |                  |                                    |                 |                  |
| 4-9-58                                                                                                                                             | .11                  | 0                  | 5-9-58           | Rain Gage 4          |                  | 5-9-58                             |                 |                  |
| 4-10-13                                                                                                                                            | 0                    | 0                  | 1:30p            | 0                    | 0                | 1:55p                              | .0025           | 0                |
| 4-14                                                                                                                                               | 1.29                 | .0140              | :40              | .84                  | .14              | 2:40                               | .0173           | .0053            |
| 4-15                                                                                                                                               | .39                  | .1165              | :50              | .60                  | .60              | :45                                | .0524           | .0082            |
| 4-16-19                                                                                                                                            | 0                    | 0                  | 2:15             | .67                  | .52              | :50                                | .0849           | .0139            |
| 4-20                                                                                                                                               | .27                  | 0                  | :45              | .14                  | .59              | 3:00                               | .1102           | .0308            |
| 4-21                                                                                                                                               | 0                    | 0                  | 5:00             | .02                  | .64              | :10                                | .0957           | .0480            |
| 4-22                                                                                                                                               | .23                  | 0                  | 6:10             | .10                  | .76              | :30                                | .0614           | .0742            |
| 4-23                                                                                                                                               | 0                    | 0                  |                  |                      |                  | 4:30                               | .0217           | .1126            |
| 4-24                                                                                                                                               | .13                  | 0                  |                  |                      |                  | 6:00                               | .0123           | .1357            |
| 4-25                                                                                                                                               | 1.11                 | .0326              |                  |                      |                  | :30                                | .0128           | .1420            |
| 4-26                                                                                                                                               | .64                  | .0326              |                  |                      |                  | 7:00                               | .0128           | .1484            |
| 4-27                                                                                                                                               | .37                  | 0                  |                  |                      |                  | :10                                | .0166           | .1509            |
| 4-28                                                                                                                                               | .35                  | 0                  |                  |                      |                  | :40                                | .0059           | .1590            |
| 4-29                                                                                                                                               | .65                  | .0699              |                  |                      |                  | 10:00                              | .0079           | .1847            |
| 4-30                                                                                                                                               | .26                  | .0140              |                  |                      |                  | 12:00m                             | .0058           | .1983            |
| 5-1                                                                                                                                                | 1.14                 | .2981              |                  |                      |                  | 5-10-58                            |                 |                  |
| 5-2                                                                                                                                                | 0                    | .0140              |                  |                      |                  | 2:00a                              | .0047           | .2089            |
| 5-3                                                                                                                                                | 0                    | .0046              |                  |                      |                  |                                    |                 |                  |
| 5-4                                                                                                                                                | .25                  | .0046              |                  |                      |                  |                                    |                 |                  |
| 5-5                                                                                                                                                | .02                  | 0                  |                  |                      |                  |                                    |                 |                  |
| 5-6-7                                                                                                                                              | 0                    | 0                  |                  |                      |                  |                                    |                 |                  |
| 5-8                                                                                                                                                | .65                  | 0                  |                  |                      |                  |                                    |                 |                  |
| 5-9                                                                                                                                                | .31 <sup>2</sup>     | .1063 <sup>3</sup> |                  |                      |                  |                                    |                 |                  |
| Watershed Conditions: 3% of area under cultivation in cotton and corn - poor cover; 3% pasture, 32% idle, 59% woods - good cover; 3% bare gullies. |                      |                    |                  |                      |                  |                                    |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 515.3.                                                                                       |                      |                    |                  |                      |                  |                                    |                 |                  |
| 1/ Recessional flow prior to storm event.                                                                                                          |                      |                    |                  |                      |                  |                                    |                 |                  |
| 2/ Rainfall prior to 6:15a.                                                                                                                        |                      |                    |                  |                      |                  |                                    |                 |                  |
| 3/ Recessional flow extending from peak at 12:50a to storm event.                                                                                  |                      |                    |                  |                      |                  |                                    |                 |                  |





OXFORD, MISSISSIPPI Watershed W-28

**LOCATION:** Marshall Co., Miss.; 2.3 mi. SW. of Holly Springs on State Highway No. 7; Walkers Bottom Creek, Pigeon Roost Creek Watershed, Yazoo River Basin.

**AREA:** 1,080 ac. (1.69 sq. mi.)      **SHAPE:** Rectangular; 2.1 mi. long, 0.8 mi. wide.

**SLOPES:** 13% is in 0-2% class; 17% in 2-5%; 10% in 5-8%; 7% in 8-12%; 10% in 12-17%; 43% in 17% and above. Aspect: NW.

**SOILS:** Loessial and Coastal Plains: Topsoil - 17% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 45% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 38% fine sandy loam, 0 to 12 ins. in depth, weak fine crumb structure. Subsoil - 17% slow permeability, impeding layer at 15 to 20 ins.; 45% moderate to slow permeability, impeding layer at 15 to 20 ins.; 38% moderate to rapid permeability, no impeding layer. Internal drainage - medium to rapid. Grenada silt loam - 17%; Providence silt loam - 45%; Ruston fine sandy loam - 38%.

**EROSION:** + - 13%; 2 - 16%; 3 - 71%.

**LAND CAPABILITY:** II - 14%; III - 9%; IV - 6%; VI - 16%; VII - 55%.

**SURFACE DRAINAGE:** Good; length of principal waterway - 1.75 mi.; sand bed channel. Approximately 60% non-contributing area due to small desilting and retention dams.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff - current meter rated section of natural sand-bottom channel; continuous water-stage recorder. Precipitation - three recording gages.

**WATERSHED CONDITIONS:** Normally about 12% is in cultivation - cotton and corn, 48% idle - good to poor cover of broom sedge and common grasses, 10% pasture - fair to poor cover; 26% woods - good to fair cover; 4% bare gullies.

**USUALLY REPRESENTS:** Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

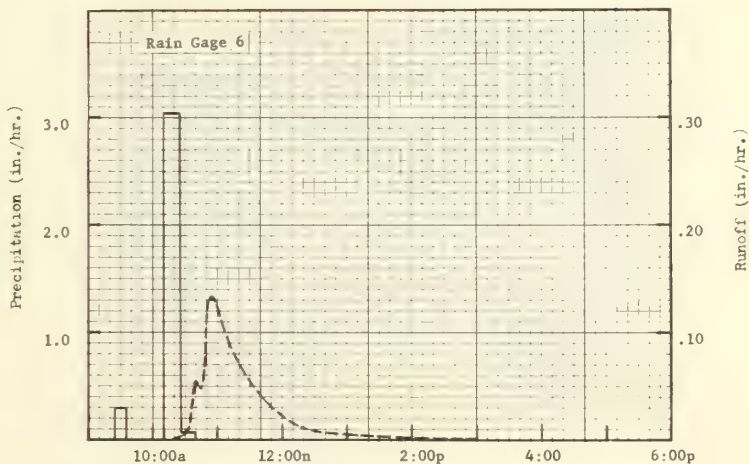
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                               |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-28<br>(Area - 1,080 Acres) |          |      |       |      |        |       |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------------------------------------------------------------|----------|------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                           | Jan.              | Feb. | Mar.                                      | Apr. | May     | June | July    | Aug.                                                       | Sept.    | Oct. | Nov.  | Dec. | Year   |       |        |      |
| 1957                                                                                                                                                                    | P                 | 8.15 | 7.02                                      | 2.42 | 5.60    | 5.16 | 5.28    | 3.80                                                       | 0.88     | 5.05 | 4.52  | 9.46 | 4.45   | 61.79 |        |      |
|                                                                                                                                                                         | Q                 | 2.53 | 1.06                                      | .11  | 1.05    | 0.60 | .14     | .09                                                        | 0        | .07  | .09   | .88  | .32    | 6.94  |        |      |
| 1958                                                                                                                                                                    | P                 | 2.43 | 1.48                                      | 3.68 | 6.49    | 3.60 | 5.45    | 7.00                                                       | 1.14     | 8.70 | 1.00  | 3.42 | 1.62   | 46.01 |        |      |
|                                                                                                                                                                         | Q                 | 0.02 | 0                                         | .7   | .26     | .27  | .01     | .30                                                        | 0        | .21  | 0     | .07  | 0      | 1.14  |        |      |
| 1959                                                                                                                                                                    | P                 | 3.75 | 4.02                                      | 3.12 | 3.53    | 4.95 | 4.34    | 3.50                                                       | 3.68     | 4.67 | 2.26  | 3.87 | 7.03   | 48.72 |        |      |
|                                                                                                                                                                         | Q                 | .14  | .16                                       | .02  | .05     | .08  | .11     | .02                                                        | 0        | .63  | 0     | .06  | .54    | 1.81  |        |      |
| Normal P                                                                                                                                                                |                   | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17                                                       | 3.13     | 3.48 | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                 |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed W-28                         |          |      |       |      |        |       |        |      |
| YEAR                                                                                                                                                                    | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                                            |          |      |       |      |        |       |        |      |
|                                                                                                                                                                         |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                                            | 12 hours |      | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                         | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                                                       | Date     | Vol. | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                                    | 4-4               | 0.36 | 4-4                                       | 0.31 | 4-4     | 0.50 | 4-3     | 0.70                                                       | 1-31     | 0.92 | 1-31  | 1.45 | 1-30   | 2.02  | 1-27   | 2.68 |
| 1958                                                                                                                                                                    | 7-22              | .24  | 7-22                                      | .17  | 7-22    | .21  | 7-22    | .22                                                        | 7-22     | .22  | 7-22  | .26  | 7-22   | .26   | 7-22   | .28  |
| 1959                                                                                                                                                                    | 9-9               | .58  | 9-9                                       | .42  | 9-9     | .54  | 9-9     | .60                                                        | 9-9      | .60  | 9-9   | .60  | 9-4    | .60   | 9-5    | .63  |
| Notes: Quality of records: Q - poor for 1957, fair for 1958, fair for 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss. |                   |      |                                           |      |         |      |         |                                                            |          |      |       |      |        |       |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.



| SELECTED RUNOFF EVENTS                                                                                                                                               |                                    |                     |                  |                      |                  | Oxford, Mississippi Watershed W-28 |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------|------------------|----------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                |                                    |                     | Rainfall         |                      |                  | Runoff <sup>1/</sup>               |                 |                  |
| Date                                                                                                                                                                 | Rainfall <sup>2/</sup><br>(inches) | Runoff<br>(inches)  | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 30, 1957                                                                                                                                               |                                    |                     |                  |                      |                  |                                    |                 |                  |
| 5-31-57                                                                                                                                                              | 0                                  | 0                   | 6-30-57          | Rain Gage 6          |                  | 6-30-57                            |                 |                  |
| 6-1                                                                                                                                                                  | .01                                | 0                   | 9:25a            | 0                    | 0                | 10:20a                             | 0               | 0                |
| 6-2                                                                                                                                                                  | .13                                | 0                   | :35              | .30                  | .05              | :30                                | .0024           | .0002            |
| 6-3                                                                                                                                                                  | .74                                | 0                   | 10:10            | 0                    | .05              | :40                                | .0542           | .0049            |
| 6-4                                                                                                                                                                  | .15                                | 0                   | :25              | 3.04                 | .81              | :45                                | .0487           | .0092            |
| 6-5                                                                                                                                                                  | .49                                | .0287               | :40              | .08                  | .83              | :50                                | .1084           | .0158            |
| 6-6-7                                                                                                                                                                | 0                                  | 0                   |                  |                      |                  | :55                                | .1331           | .0259            |
| 6-8                                                                                                                                                                  | .10                                | 0                   | 6-30-57          | Rain Gage 5          |                  | 11:05                              | .1084           | .0460            |
| 6-9                                                                                                                                                                  | .08                                | 0                   | 9:20a            | 0                    | 0                | :20                                | .0725           | .0685            |
| 6-10                                                                                                                                                                 | .31                                | 0                   | :30              | .30                  | .05              | :45                                | .0376           | .0904            |
| 6-11-18                                                                                                                                                              | 0                                  | 0                   | :45              | .08                  | .07              | 12:15p                             | .0129           | .1010            |
| 6-19                                                                                                                                                                 | .02                                | 0                   | 10:05            | 0                    | .07              | 1:00                               | .0007           | .1044            |
| 6-20                                                                                                                                                                 | 0                                  | 0                   | :20              | 2.76                 | .76              | 2:15                               | .0001           | .1049            |
| 6-21                                                                                                                                                                 | .02                                | 0                   | :35              | .60                  | .91              | 3:00                               | 0               | .1050            |
| 6-22                                                                                                                                                                 | .37                                | 0                   | :50              | .12                  | .94              |                                    |                 |                  |
| 6-23                                                                                                                                                                 | .43                                | 0                   | 6-30-57          | Rain Gage 7          |                  |                                    |                 |                  |
| 6-24                                                                                                                                                                 | .08                                | 0                   |                  |                      |                  |                                    |                 |                  |
| 6-25-26                                                                                                                                                              | 0                                  | 0                   |                  | See Page 62.9-2      |                  |                                    |                 |                  |
| 6-27                                                                                                                                                                 | 1.05                               | .0012               |                  |                      |                  |                                    |                 |                  |
| 6-28-29                                                                                                                                                              |                                    | 0                   |                  |                      |                  |                                    |                 |                  |
| Watershed Conditions: 12% of area under cultivation in cotton and corn - fair to good cover; 10% pasture, 48% idle, 26% woods - good cover; 4% bare gullies.         |                                    |                     |                  |                      |                  |                                    |                 |                  |
| Event of July 22, 1958                                                                                                                                               |                                    |                     |                  |                      |                  |                                    |                 |                  |
| 6-22-58                                                                                                                                                              | 0                                  | 0                   | 7-22-58          | Rain Gage 6          |                  | 7-22-58                            |                 |                  |
| 6-23-24                                                                                                                                                              | 0                                  | 0                   | 4:40p            | 0                    | 0                | 5:00p                              | 0               | 0                |
| 6-25                                                                                                                                                                 | .77                                | 0                   | :50              | 1.26                 | .21              | :15                                | .0006           | .0001            |
| 6-26                                                                                                                                                                 | .57                                | .0022               | 5:05             | .08                  | .23              | :30                                | .0184           | .0025            |
| 6-27-30                                                                                                                                                              | 0                                  | 0                   | :15              | 2.10                 | .58              | :40                                | .0716           | .0095            |
| 7-1-4                                                                                                                                                                | 0                                  | 0                   | :25              | .06                  | .59              | :45                                | .1377           | .0182            |
| 7-5                                                                                                                                                                  | .10                                | 0                   | :40              | 2.00                 | 1.09             | :50                                | .2002           | .0323            |
| 7-6                                                                                                                                                                  | .07                                | 0                   | 6:05             | .72                  | 1.39             | 6:00                               | .2415           | .0691            |
| 7-7                                                                                                                                                                  | .53                                | 0                   |                  |                      |                  | :15                                | .2121           | .1261            |
| 7-8                                                                                                                                                                  | .10                                | 0                   |                  |                      |                  | :30                                | .1331           | .1693            |
| 7-9-11                                                                                                                                                               | 0                                  | 0                   | 7-22-58          | Rain Gage 5          |                  | :45                                | .0753           | .1951            |
| 7-12                                                                                                                                                                 | 1.57                               | .0198               | 3:30p            | 0                    | 0                | 7:00                               | .0422           | .2097            |
| 7-13-20                                                                                                                                                              | 0                                  | 0                   | :32              | 3.00                 | .10              | :30                                | .0129           | .2237            |
| 7-21                                                                                                                                                                 | .69                                | 0                   | :36              | .15                  | .11              | 8:00                               | .0006           | .2292            |
| 7-22                                                                                                                                                                 | 1.41                               | .0687 <sup>3/</sup> | :50              | 1.88                 | .55              | 9:00                               | 0               | .2295            |
|                                                                                                                                                                      |                                    |                     | 4:00             | .90                  | .70              |                                    |                 |                  |
|                                                                                                                                                                      |                                    |                     | 5:15             | .12                  | .85              |                                    |                 |                  |
| Watershed Conditions: 12% of area under cultivation in cotton and corn - good to fair cover; 10% pasture, 48% idle, 26% woods - good to fair cover; 4% bare gullies. |                                    |                     |                  |                      |                  |                                    |                 |                  |
|                                                                                                                                                                      |                                    |                     | 7-22-58          | Rain Gage 7          |                  |                                    |                 |                  |
|                                                                                                                                                                      |                                    |                     | 3:30p            | 0                    | 0                |                                    |                 |                  |
|                                                                                                                                                                      |                                    |                     | :36              | 1.00                 | .10              |                                    |                 |                  |
|                                                                                                                                                                      |                                    |                     | :53              | 3.53                 | .90              |                                    |                 |                  |
|                                                                                                                                                                      |                                    |                     | 4:00             | 1.29                 | 1.05             |                                    |                 |                  |
|                                                                                                                                                                      |                                    |                     | :06              | .90                  | 1.14             |                                    |                 |                  |
|                                                                                                                                                                      |                                    |                     | :30              | .15                  | 1.20             |                                    |                 |                  |
|                                                                                                                                                                      |                                    |                     | 5.00             | .10                  | 1.25             |                                    |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 1089.0.                                                                                                        |                                    |                     |                  |                      |                  |                                    |                 |                  |
| 1/ 58% of watershed area is noncontributing due to small desilting and retention dams; no overflow occurred.                                                         |                                    |                     |                  |                      |                  |                                    |                 |                  |
| 2/ Rain gages 5, 6, and 7 Thiessen weighted; 5-19.2%, 6-68.3%, and 7-12.5%.                                                                                          |                                    |                     |                  |                      |                  |                                    |                 |                  |
| 3/ Runoff 4:10-6:40a, .0638 in. and runoff 9:10a-12:40p, .0049 in.                                                                                                   |                                    |                     |                  |                      |                  |                                    |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                                                              |                                    |                    |                  |                                    |                  | Oxford, Mississippi Watershed W-28 |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------|------------------|------------------------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                               |                                    |                    | Rainfall         |                                    |                  | Runoff <sup>1/</sup>               |                 |                  |
| Date                                                                                                                                                | Rainfall <sup>2/</sup><br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr)               | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of September 9, 1959                                                                                                                          |                                    |                    |                  |                                    |                  |                                    |                 |                  |
| 8-7-59                                                                                                                                              | 0                                  | 0                  | 9-9-59           | Rain Gage 6                        |                  | 9-9-59                             |                 |                  |
| 8-8-15                                                                                                                                              | 0                                  | 0                  | 12:00n           | 0                                  | 0                | 12:15p                             | 0               | 0                |
| 8-16                                                                                                                                                | 0.04                               | 0                  | :15p             | 5.60                               | 1.40             | :20                                | .0251           | .0010            |
| 8-17                                                                                                                                                | 0                                  | 0                  | :30              | 3.56                               | 2.29             | :30                                | .2360           | .0228            |
| 8-18                                                                                                                                                | .89                                | 0                  | :45              | .80                                | 2.49             | :40                                | .4770           | .0822            |
| 8-19                                                                                                                                                | .19                                | 0                  | 1:15             | .34                                | 2.66             | :50                                | .5610           | .1702            |
| 8-20                                                                                                                                                | .04                                | 0                  | 2:00             | .04                                | 2.69             | 1:00                               | .5032           | .2589            |
| 8-21                                                                                                                                                | .29                                | 0                  | 3:00             | .02                                | 2.71             | :10                                | .4210           | .3359            |
| 8-22                                                                                                                                                | .35                                | 0                  | :30              | 0                                  | 2.71             | :20                                | .3420           | .3359            |
| 8-23                                                                                                                                                | 0                                  | 0                  | 4:00             | .02                                | 2.72             | :30                                | .2540           | .4486            |
| 8-24                                                                                                                                                | .14                                | 0                  | :45              | .05                                | 2.76             | :50                                | .1550           | .5168            |
| 8-25                                                                                                                                                | .49                                | 0                  |                  |                                    |                  | 2:20                               | .0810           | .5741            |
| 8-26-29                                                                                                                                             | 0                                  | 0                  |                  |                                    |                  | 3:10                               | .0350           | .6190            |
| 8-30                                                                                                                                                | .74                                | 0                  |                  |                                    |                  | 4:30                               | .0085           | .6470            |
| 8-31                                                                                                                                                | 0                                  | 0                  |                  |                                    |                  | 6:00                               | .0015           | .6545            |
| 9-1                                                                                                                                                 | .16                                | 0                  | 9-9-59           | Rain Gages 5, 6, & 7 <sup>2/</sup> |                  | 7:15                               | 0               | .6555            |
| 9-2-4                                                                                                                                               | 0                                  | 0                  | 11:55a           | 0                                  | 0                |                                    |                 |                  |
| 9-5                                                                                                                                                 | 1.00                               | .0374              | 12:00n           | 1.09                               | .09              |                                    |                 |                  |
| 9-6-8                                                                                                                                               | 0                                  | 0                  | :15p             | 4.59                               | 1.23             |                                    |                 |                  |
|                                                                                                                                                     |                                    |                    | :30              | 4.14                               | 2.27             |                                    |                 |                  |
|                                                                                                                                                     |                                    |                    | :45              | .98                                | 2.52             |                                    |                 |                  |
|                                                                                                                                                     |                                    |                    | 1:00             | .57                                | 2.66             |                                    |                 |                  |
|                                                                                                                                                     |                                    |                    | :15              | .34                                | 2.76             |                                    |                 |                  |
| Watershed Conditions: 12% of area in matured cotton and cover - good to fair cover; 10% pasture, 48% idle, 26% woods - good cover; 4% bare gullies. |                                    |                    |                  |                                    |                  |                                    |                 |                  |



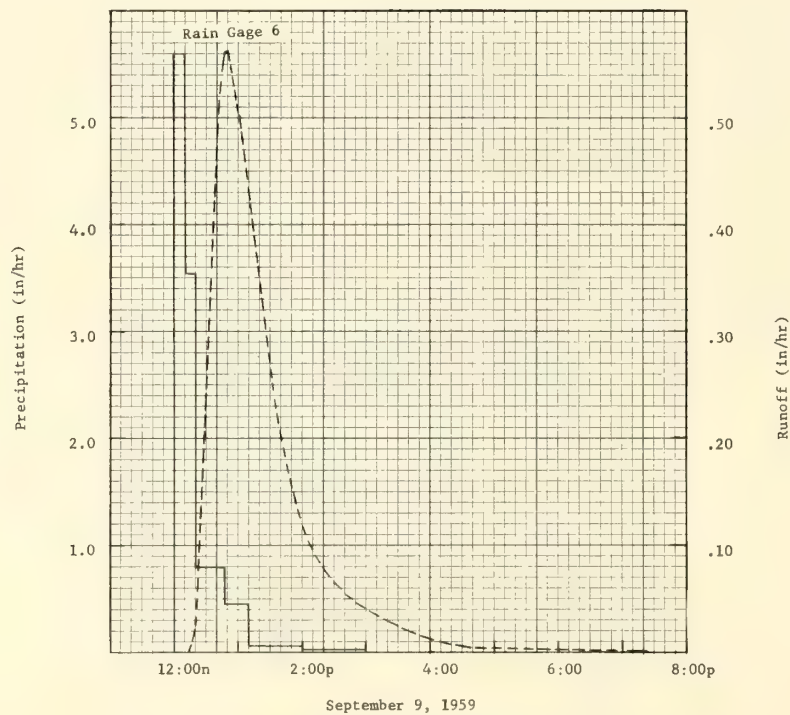
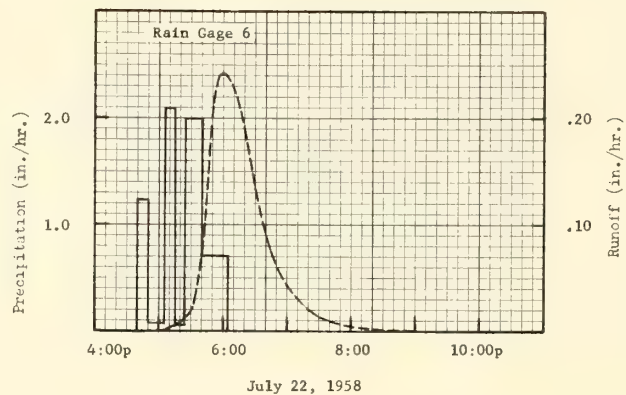
June 30, 1957

OXFORD, MISSISSIPPI WATERSHED W-28

Notes: To convert runoff in in/hr to cfs, multiply by 1089.0

1/ 59 percent of watershed area is noncontributing due to small desilting and retention dams; no overflow occurred.

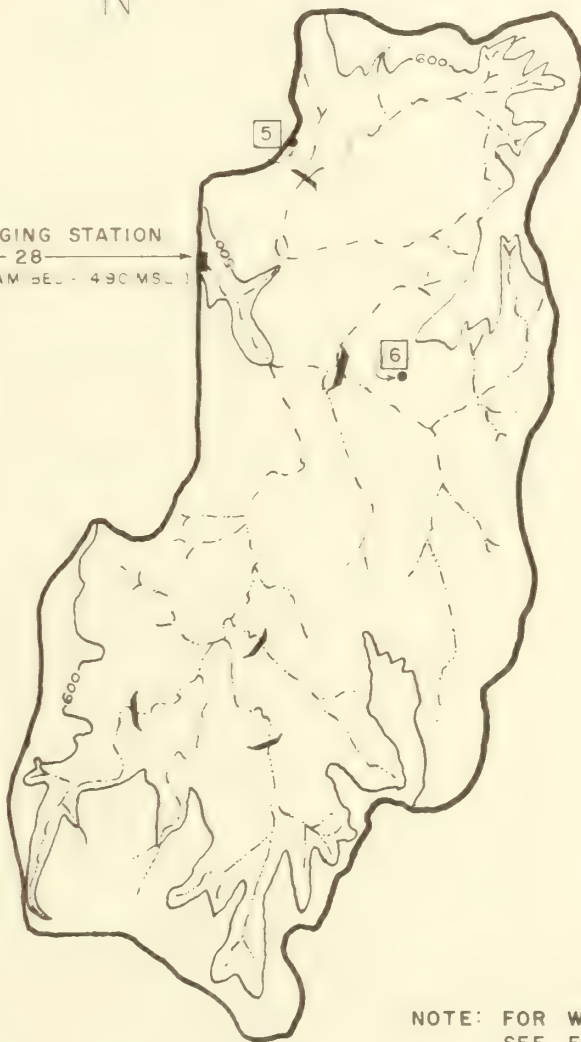
2/ Rain gages 5, 6, and 7 Thiessen weighted.



OXFORD, MISSISSIPPI WATERSHED W-28



GAGING STATION  
W-28  
(STREAM BED - 490 MSL)



NOTE: FOR WATERSHED LOCATION  
SEE FIGURE 1, PAGE 62.II-5

0 1/4 1/2  
SCALE IN MILES

CONTOUR INTERVAL - 100 FEET

7  
RECORDING  
RAIN GAGE  
(ACTUAL)

— DETENTION STRUCTURE

OXFORD, MISSISSIPPI  
WATERSHED W-28

AREA: 1080 ACRES



## OXFORD, MISSISSIPPI Watershed W-30

**LOCATION:** Marshall Co., Miss.; 4.6 mi. S. of Holly Springs on State Highway No. 7; Chews Creek, Pigeon Roost Creek Watershed, Yazoo River Basin.

**AREA:** 113 ac.

**SHAPE:** Triangular; base 3,100 ft., altitude 3,200 ft.

**SLOPES:** 7% is in 0-2% class; 32% in 2-5%; 8% in 5-8%; 14% in 8-12%; 7% in 12-17%; 32% in 17% and above. Aspect W.

**SOILS:** Loessial and Coastal Plains; 11% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 12% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 18% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 51% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 8% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 11% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 12% slow permeability, impeding layer at 15 to 20 ins.; 18% moderate to slow permeability, impeding layer at 15 to 20 ins.; 51% moderate to rapid permeability, no impeding layer; 8% moderate to moderately rapid permeability, no impeding layer. Internal drainage - medium to slow. Loring silt loam - 11%; Grenada silt loam - 12%; Providence silt loam and silty clay loam - 18%; Ruston fine sandy loam - 51%; Hymon loam - 8%.

**EROSION:** + - 8%; 2 - 20%; 3 - 72%.

**LAND CAPABILITY:** II - 10%; III - 4%; IV - 5%; VI - 28%; VII - 53%.

**SURFACE DRAINAGE:** Good; length of principal waterway - .5 mi.; sand bed channel. Approximately 10% non-contributing area due to small desilting and retention dams in 1957, increased to 89% in December, 1960.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff-current meter rated section of natural sand-bottom channel; continuous water-stage recorder at 8 x 4 ft. box culvert with 60° wing walls. Precipitation - one recording gage.

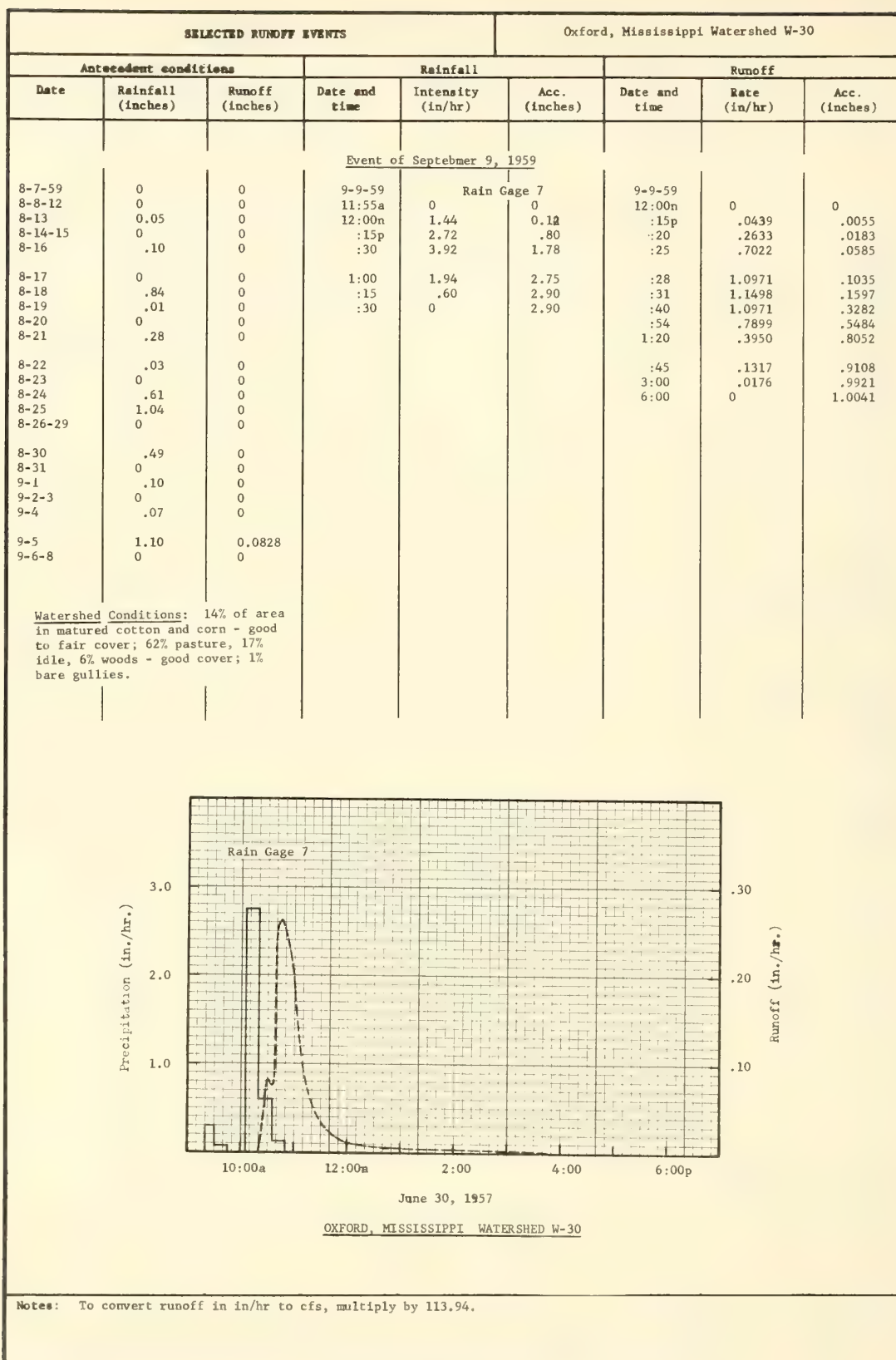
**WATERSHED CONDITIONS:** Normally about 14% is in cultivation - cotton and corn, 17% idle - fair to good cover, 62% pasture - good to poor cover of Bermuda grass; 6% woods - good to fair cover; 1% bare gullies.

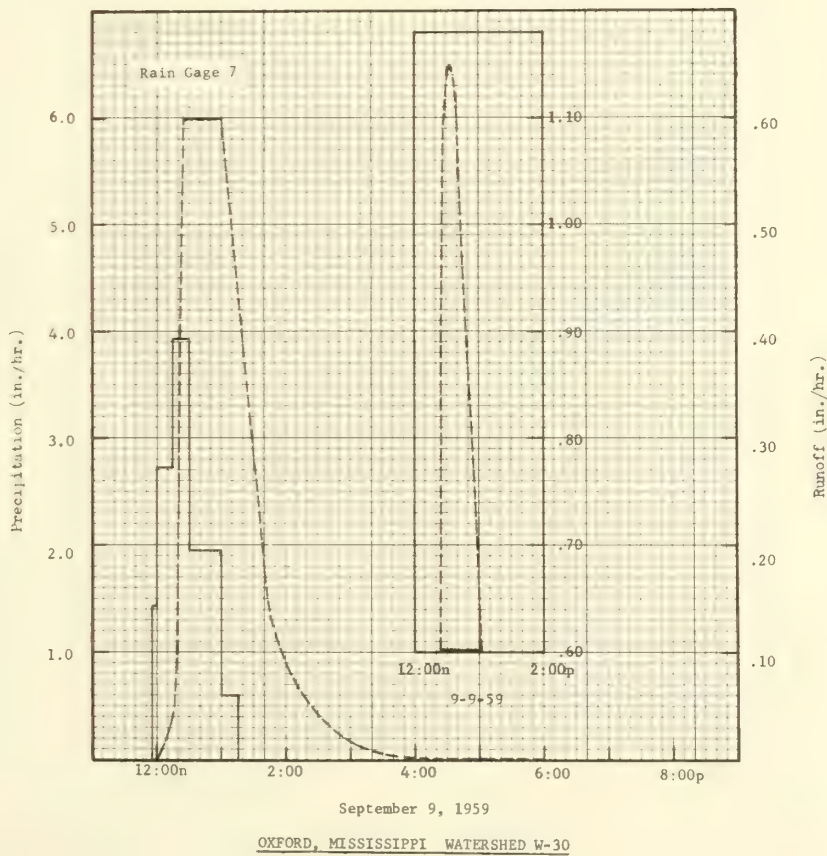
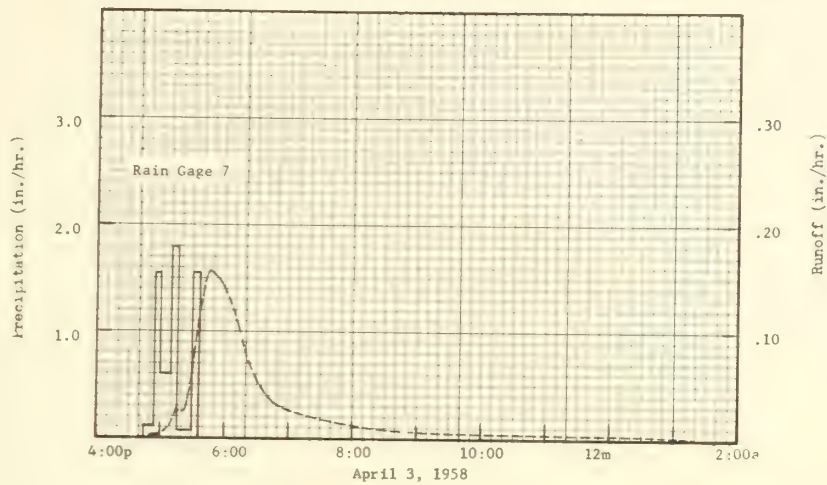
**GENERALLY REPRESENTS:** Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and Southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                 |                   |      |                                           |      |         |      |         |      | Oxford, Mississippi Watershed W-30<br>(Area - 113 Acres) |       |       |      |        |       |        |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|----------------------------------------------------------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                             |                   | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July | Aug.                                                     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                      | P                 | 7.66 | 7.04                                      | 2.41 | 6.12    | 5.07 | 4.72    | 3.81 | 1.22                                                     | 5.47  | 3.84  | 9.50 | 4.26   | 61.12 |        |      |
|                                                                                                                                                           | Q                 | 3.06 | 2.29                                      | .23  | 1.53    | .56  | .23     | .23  | 0                                                        | .25   | .19   | 2.56 | .52    | 11.65 |        |      |
| 1958                                                                                                                                                      | P                 | 2.39 | 1.48                                      | 3.63 | 6.75    | 3.25 | 5.63    | 8.55 | 0.98                                                     | 10.62 | 1.01  | 3.49 | 1.57   | 49.35 |        |      |
|                                                                                                                                                           | Q                 | 0.17 | .02                                       | .12  | .93     | .54  | .17     | 1.51 | 0                                                        | 1.45  | 0     | .35  | 0      | 5.26  |        |      |
| 1959                                                                                                                                                      | P                 | 3.64 | 3.85                                      | 2.90 | 2.94    | 4.52 | 4.09    | 3.69 | 3.88                                                     | 5.12  | 2.44  | 3.68 | 6.90   | 47.65 |        |      |
|                                                                                                                                                           | Q                 | .60  | .87                                       | .10  | .02     | .14  | .29     | 0    | 0                                                        | 1.04  | .04   | .12  | 1.22   | 4.44  |        |      |
| Normal                                                                                                                                                    | P                 | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17 | 3.13                                                     | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                   |                   |      |                                           |      |         |      |         |      | Oxford, Mississippi Watershed W-30                       |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                      | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |                                                          |       |       |      |        |       |        |      |
|                                                                                                                                                           |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours                                                 |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                           | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date                                                     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                      | 11-13             | 0.66 | 11-13                                     | 0.60 | 11-13   | 0.88 | 11-13   | 1.19 | 11-13                                                    | 1.52  | 11-13 | 1.60 | 1-31   | 2.30  | 1-28   | 3.76 |
| 1958                                                                                                                                                      | 7-22              | .86  | 7-22                                      | .48  | 7-22    | .55  | 7-22    | .63  | 7-22                                                     | .78   | 7-22  | 1.10 | 7-21   | 1.12  | 7-21   | 1.51 |
| 1959                                                                                                                                                      | 9-9               | 1.15 | 9-9                                       | .76  | 9-9     | .92  | 9-9     | .95  | 9-9                                                      | .95   | 9-9   | .95  | 9-9    | .95   | 12-11  | 1.18 |
| Notes: Quality of records: Q - good for 1957, 1958, and 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss. |                   |      |                                           |      |         |      |         |      |                                                          |       |       |      |        |       |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

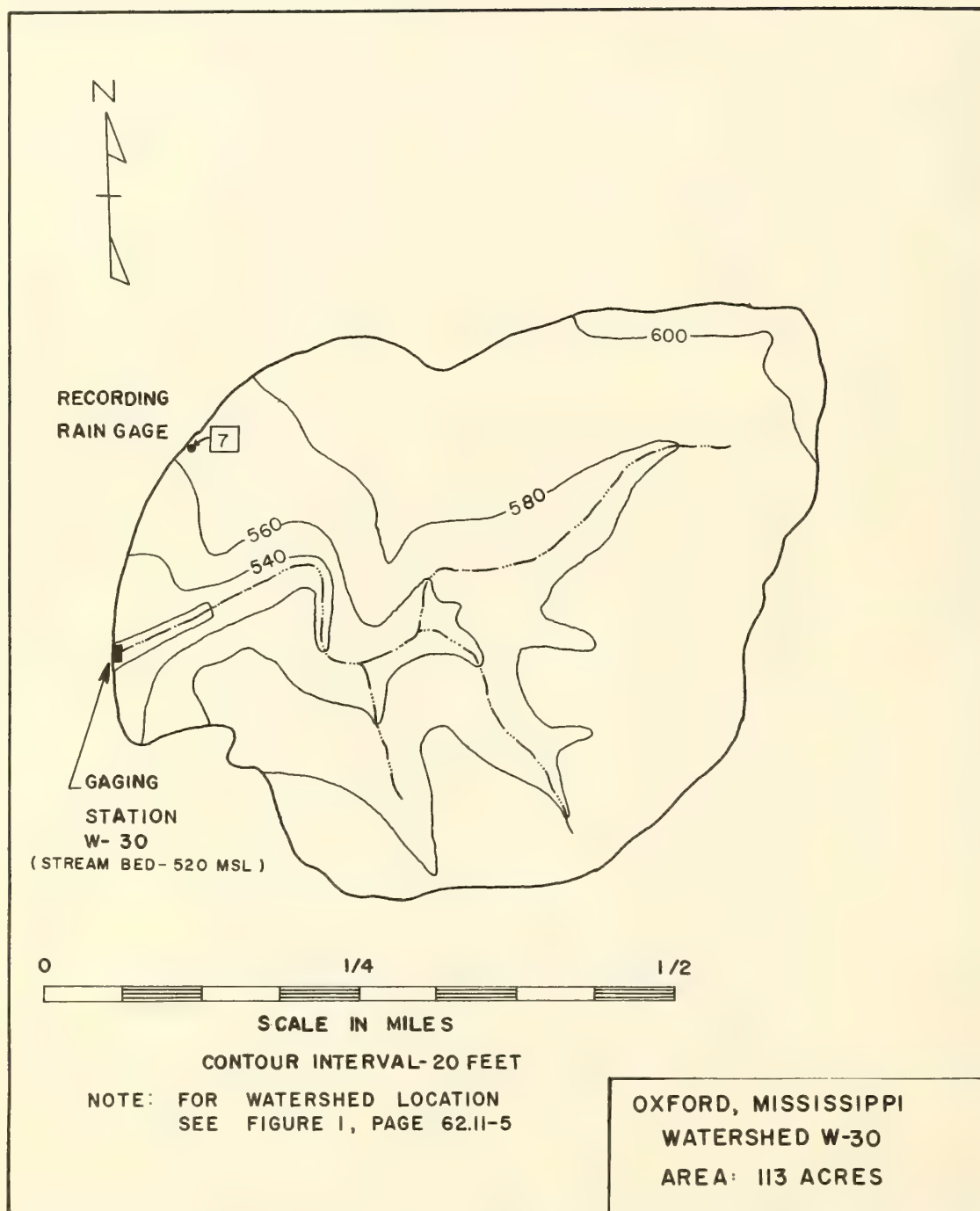
| SELECTED RUNOFF EVENTS                                                                                                                                 |                      |                     | Oxford, Mississippi Watershed W-30 |                      |                  |                  |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|------------------------------------|----------------------|------------------|------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                  |                      |                     | Rainfall                           |                      |                  | Runoff           |                 |                  |
| Date                                                                                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches)  | Date and<br>time                   | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of June 30, 1957                                                                                                                                 |                      |                     |                                    |                      |                  |                  |                 |                  |
| 5-31-57                                                                                                                                                | 0                    | 0                   | 6-30-57                            | Rain Gage 7          |                  | 6-30-57          |                 |                  |
| 6-1                                                                                                                                                    | .07                  | 0                   | 9:30a                              | 0                    | 0                | 10:20a           | 0               | 0                |
| 6-2                                                                                                                                                    | .70                  | 0                   | :35                                | .60                  | .05              | :25              | .0413           | .0017            |
| 6-3                                                                                                                                                    | .18                  | 0                   | 10:10                              | 0                    | .05              | :30              | .0834           | .0069            |
| 6-4-7                                                                                                                                                  | 0                    | 0                   | :25                                | 3.20                 | .85              | :35              | .0755           | .0135            |
| 6-8                                                                                                                                                    | .03                  | 0                   | :40                                | .08                  | .87              | :40              | .2458           | .0269            |
| 6-9                                                                                                                                                    | 0                    | 0                   |                                    |                      |                  | :45              | .2633           | .0481            |
| 6-10                                                                                                                                                   | .35                  | 0                   |                                    |                      |                  | :55              | .2283           | .0891            |
| 6-11-17                                                                                                                                                | 0                    | 0                   |                                    |                      |                  | 11:10            | .0965           | .1297            |
| 6-18                                                                                                                                                   | .26                  | 0                   |                                    |                      |                  | :35              | .0263           | .1526            |
| 6-21                                                                                                                                                   | 0                    | 0                   |                                    |                      |                  | 1:00p            | .0053           | .1710            |
| 6-22                                                                                                                                                   | .35                  | 0                   |                                    |                      |                  | 3:45             | 0               | .1754            |
| 6-23                                                                                                                                                   | .26                  | 0                   |                                    |                      |                  |                  |                 |                  |
| 6-24                                                                                                                                                   | .10                  | 0                   |                                    |                      |                  |                  |                 |                  |
| 6-25-26                                                                                                                                                | 0                    | 0                   |                                    |                      |                  |                  |                 |                  |
| 6-27                                                                                                                                                   | 1.12                 | 0                   |                                    |                      |                  |                  |                 |                  |
| 6-28                                                                                                                                                   | 0                    | .0211               |                                    |                      |                  |                  |                 |                  |
| 6-29                                                                                                                                                   | 0                    | 0                   |                                    |                      |                  |                  |                 |                  |
| Watershed Conditions: 14% of area<br>in cotton and corn - fair to good<br>cover; 62% pasture, 17% idle, 6%<br>woods - good cover; 1% bare gullies.     |                      |                     |                                    |                      |                  |                  |                 |                  |
| Event of April 3, 1958                                                                                                                                 |                      |                     |                                    |                      |                  |                  |                 |                  |
| 3-4-58                                                                                                                                                 | 0                    | 0                   | 4-3-58                             | Rain Gage 7          |                  | 4-3-58           |                 |                  |
| 3-5                                                                                                                                                    | 0                    | 0                   | 4:45p                              | 0                    | 0                | 4:55p            | 0               | 0                |
| 3-6                                                                                                                                                    | .05                  | 0                   | :55                                | .12                  | .02              | 5:05             | .0061           | .0007            |
| 3-7                                                                                                                                                    | .66                  | 0                   | 5:00                               | 1.56                 | .15              | :15              | .0281           | .0035            |
| 3-8                                                                                                                                                    | .38                  | 0                   | :10                                | .60                  | .25              | :20              | .0263           | .0058            |
| 3-9-11                                                                                                                                                 | 0                    | 0                   | :15                                | 1.80                 | .40              | :25              | .0386           | .0085            |
| 3-12                                                                                                                                                   | .08                  | 0                   | :30                                | .08                  | .42              | :35              | .1053           | .0205            |
| 3-13                                                                                                                                                   | .07                  | 0                   | :35                                | 1.56                 | .55              | :40              | .1317           | .0304            |
| 3-14-16                                                                                                                                                | 0                    | 0                   |                                    |                      |                  | :45              | .1580           | .0425            |
| 3-17                                                                                                                                                   | .62                  | 0                   |                                    |                      |                  | :55              | .1492           | .0681            |
| 3-18-21                                                                                                                                                | 0                    | 0                   |                                    |                      |                  | 6:00             | .1404           | .0802            |
| 3-22                                                                                                                                                   | .03                  | 0                   |                                    |                      |                  | :15              | .0965           | .1098            |
| 3-23                                                                                                                                                   | 1.04                 | .0632               |                                    |                      |                  | :30              | .0544           | .1286            |
| 3-24                                                                                                                                                   | .05                  | .0211               |                                    |                      |                  | :45              | .0334           | .1394            |
| 3-25                                                                                                                                                   | .26                  | 0                   |                                    |                      |                  | 7:00             | .0281           | .1471            |
| 3-26                                                                                                                                                   | .27                  | .0421               |                                    |                      |                  | 8:00             | .0114           | .1661            |
| 3-27-28                                                                                                                                                | 0                    | 0                   |                                    |                      |                  | 10:00            | .0053           | .1821            |
| 3-29                                                                                                                                                   | .05                  | 0                   |                                    |                      |                  | 12:00m           | .0035           | .1909            |
| 3-30                                                                                                                                                   | .07                  | 0                   |                                    |                      |                  | 4-4-58           |                 |                  |
| 3-31                                                                                                                                                   | 0                    | 0                   |                                    |                      |                  | 5:00a            | 0               | .1999            |
| 4-1-58                                                                                                                                                 | 0                    | 0                   |                                    |                      |                  |                  |                 |                  |
| 4-2                                                                                                                                                    | .08                  | 0                   |                                    |                      |                  |                  |                 |                  |
| 4-3                                                                                                                                                    | .97                  | .1577 <sup>1/</sup> |                                    |                      |                  |                  |                 |                  |
| Watershed Conditions: 14% of area<br>tilled for planting of row crops;<br>62% pasture, 17% idle, 6% woods -<br>good to fair cover; 1% bare<br>gullies. |                      |                     |                                    |                      |                  |                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 113.94<br><sup>1/</sup> Runoff for period 9:35a to 4:55p.                                        |                      |                     |                                    |                      |                  |                  |                 |                  |





OXFORD, MISSISSIPPI WATERSHED W-30





OXFORD, MISSISSIPPI Watershed W-32

**LOCATION:** Marshall Co., Miss.; 4.6 mi. E. of Walhill on county road; Cuffawa Creek, Pigeon Roost Creek Watershed, Yazoo River Basin.

**AREA:** 20,000 ac. (31.3 sq. mi.)

**SHAPE:** Circular; diameter 6.4 mi.

**SLOPES:** 20% is in 0-2% class; 27% in 2-5%; 6% in 5-8%; 12% in 8-12%; 17% in 12-17%; 18% in 17% and above. Aspect N.

**SOILS:** Loessial and Coastal Plains; topsoil - 8% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 12% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 14% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 46% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 20% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 8% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 12% slow permeability, impeding layer at 15 to 20 ins.; 14% moderate to slow permeability, impeding layer at 15 to 20 ins.; 46% moderate to rapid permeability, no impeding layer; 20% moderate to moderately rapid permeability, no impeding layer. Internal drainage - medium to slow. Loring silt loam - 8%; Grenada silt loam - 12%; Providence silt loam and silty clay loam - 14%; Ruston fine sandy loam - 46%; Hymon loam - 20%.

**EROSION:** + - 20%; 2 - 22%; 3 - 58%.

**LAND CAPABILITY:** II - 28%; III - 10%; IV - 8%; VI - 10%; VII - 44%.

**SURFACE DRAINAGE:** Good; length of principal waterway - 9.5 mi.; main tributary (Dry Fork Creek) - 5.75 mi. long; sand bed channels; dredged channel to gaging station 35. About 12% non-contributing area due to small desilting and retention dams.

**CHARACTER OF FLOW:** Spring-fed intermittent, continuous.

**INSTRUMENTATION:** Runoff - current meter rated section of dredged sand-bottom channel; continuous water-stage recorder. Precipitation - seven recording gages, increased to ten recording gages, July, 1959.

**WATERSHED CONDITIONS:** Normally about 23% is in cultivation - cotton and corn, 49% idle - good to poor cover of broom sedge and common grasses, 14% pasture - good to poor cover; 12% woods - good to fair cover; 2% bare gullies.

**GENERALLY REPRESENTS:** Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

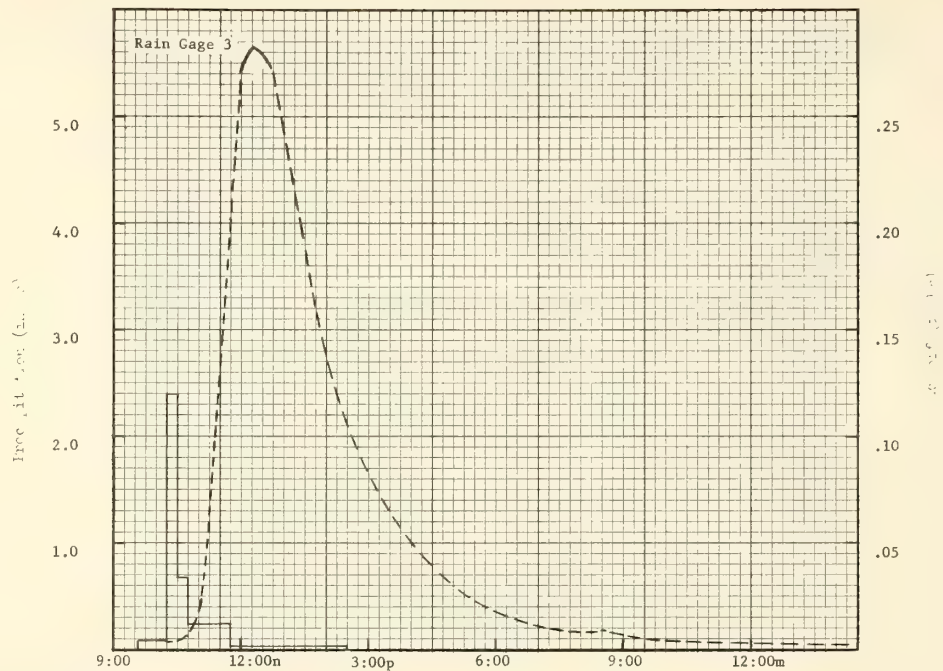
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                    |                      |      |                                           |      |         |      |         |      | Oxford, Mississippi Watershed W-32<br>(Area - 20,000 Acres) |      |       |      |        |       |        |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------|-------------------------------------------|------|---------|------|---------|------|-------------------------------------------------------------|------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                | Jan.                 | Feb. | Mar.                                      | Apr. | May     | June | July    | Aug. | Sept.                                                       | Oct. | Nov.  | Dec. | Year   |       |        |      |
| 1957                                                                                                                                                         | P                    | 8.00 | 6.64                                      | 2.46 | 7.32    | 6.00 | 7.02    | 2.43 | 2.03                                                        | 6.95 | 3.47  | 9.87 | 4.90   | 67.09 |        |      |
|                                                                                                                                                              | Q                    | 3.22 | 1.72                                      | .06  | 1.97    | 1.88 | .40     | .19  | .03                                                         | .86  | .03   | 3.63 | 1.48   | 15.47 |        |      |
| 1958                                                                                                                                                         | P                    | 2.80 | 1.93                                      | 3.91 | 7.70    | 4.92 | 4.28    | 6.10 | 0.79                                                        | 9.97 | 1.02  | 3.48 | 1.68   | 48.58 |        |      |
|                                                                                                                                                              | Q                    | 0.52 | .24                                       | .59  | 2.93    | 1.76 | .11     | .43  | 0                                                           | 1.55 | 0     | .26  | 0      | 8.39  |        |      |
| 1959                                                                                                                                                         | P                    | 4.24 | 4.25                                      | 3.44 | 4.21    | 5.45 | 3.59    | 5.38 | 3.76                                                        | 4.03 | 1.99  | 2.99 | 6.88   | 50.21 |        |      |
|                                                                                                                                                              | Q                    | 1.31 | 1.47                                      | .52  | .58     | .51  | .63     | .22  | .13                                                         | .52  | .03   | .03  | 1.93   | 7.88  |        |      |
| Normal                                                                                                                                                       | P                    | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17 | 3.13                                                        | 3.48 | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM<br>VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                   |                      |      |                                           |      |         |      |         |      | Oxford, Mississippi Watershed W-32                          |      |       |      |        |       |        |      |
| YEAR                                                                                                                                                         | MAXIMUM<br>DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |                                                             |      |       |      |        |       |        |      |
|                                                                                                                                                              |                      |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours                                                    |      | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                              | Date                 | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date                                                        | Vol. | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                         | 11-13                | 0.33 | 11-13                                     | 0.32 | 11-13   | 0.60 | 11-13   | 1.20 | 11-13                                                       | 1.38 | 1-31  | 1.75 | 1-31   | 2.53  | 1-27   | 3.58 |
| 1958                                                                                                                                                         | 4-3                  | .47  | 4-3                                       | .43  | 4-3     | .73  | 4-3     | 1.04 | 4-3                                                         | 1.14 | 4-3   | 1.18 | 9-19   | 1.26  | 4-25   | 2.22 |
| 1959                                                                                                                                                         | 12-18                | .18  | 12-18                                     | .17  | 12-18   | .31  | 12-18   | .54  | 12-18                                                       | .60  | 2-13  | .87  | 12-16  | 1.09  | 12-11  | 1.80 |
| Notes: Quality of records: Q - fair for 1957 and 1958, fair for 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB, Holly Springs 2N, Miss. |                      |      |                                           |      |         |      |         |      |                                                             |      |       |      |        |       |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

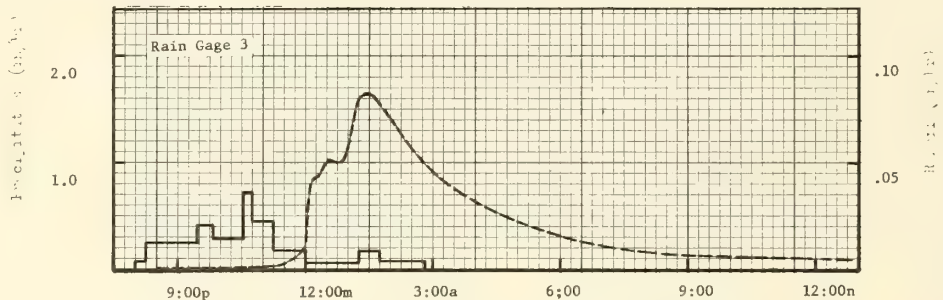
| SELECTED RUNOFF EVENTS                                          |                                    |                     |                  |                           | Oxford, Mississippi Watershed W-32 |                  |                 |                  |
|-----------------------------------------------------------------|------------------------------------|---------------------|------------------|---------------------------|------------------------------------|------------------|-----------------|------------------|
| Antecedent conditions                                           |                                    |                     | Rainfall         |                           |                                    | Runoff           |                 |                  |
| Date                                                            | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches)  | Date and<br>time | Intensity<br>(in/hr)      | Acc.<br>(inches)                   | Date and<br>time | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of November 18, 1957                                      |                                    |                     |                  |                           |                                    |                  |                 |                  |
| 10-19-57                                                        | 0                                  | .0001               | 11-18-57         | Rain Gage 3 <sup>2/</sup> |                                    | 11-18-57         |                 |                  |
| 10-20-21                                                        | 0                                  | .0002               | 9:30a            | 0                         | 0                                  | 10:15a           | .0040           | 0                |
| 10-22                                                           | .74                                | .0002               | 10:15            | .08                       | .05                                | :45              | .0056           | .0024            |
| 10-23                                                           | .84                                | .0226               | :30              | 2.40                      | .65                                | 11:05            | .0248           | .0074            |
| 10-24                                                           | 0                                  | .0045               | :45              | .68                       | .82                                | :15              | .0620           | .0143            |
| 10-25-28                                                        | 0                                  | .0008               | 11:45            | .23                       | 1.05                               | :30              | .1363           | .0394            |
| 10-29                                                           | .05                                | .0002               | 2:30p            | .03                       | 1.12                               | :45              | .2093           | .0826            |
| 10-30                                                           | .25                                | .0002               |                  |                           |                                    | 12:00n           | .2727           | .1429            |
| 10-31                                                           | T                                  | .0002               | 11-18-57         | Rain Gages <sup>1/</sup>  |                                    | :15p             | .2826           | .2124            |
| 11-1                                                            | 0                                  | .0002               | 7:45             | 0                         | 0                                  | :30              | .2777           | .2824            |
| 11-2                                                            | .04                                | .0002               | 8:30a            | .05                       | .04                                | :45              | .2702           | .3509            |
| 11-3                                                            | .20                                | .0002               | 9:15             | T                         | .04                                | 1:15             | .2207           | .4754            |
| 11-4-6                                                          | 0                                  | .0006               | 10:15            | .04                       | .08                                | :30              | .1884           | .5266            |
| 11-7                                                            | 1.59                               | .0881               | :45              | 1.44                      | .81                                | 2:00             | .1388           | .6075            |
| 11-8                                                            | .46                                | .3618               | 11:45            | .29                       | 1.10                               | 3:00             | .0818           | .7097            |
| 11-9                                                            | 0                                  | .0006               | 1:30p            | .10                       | 1.27                               | 4:00             | .0496           | .7743            |
| 11-10-11                                                        | 0                                  | .0002               |                  |                           |                                    | 5:00             | .0300           | .8145            |
| 11-12                                                           | .41                                | .0001               | 11-18-57         | Rain Gage 9               |                                    | 6:00             | .0196           | .8390            |
| 11-13                                                           | 2.89                               | .9890               | 10:15a           | 0                         | 0                                  | :30              | .0144           | .8473            |
| 11-14                                                           | .33                                | .4570               | 1:30p            |                           | 1.22                               | 7:00             | .0112           | .8537            |
| 11-15                                                           | .18                                | .0179               | 11-18-57         | Rain Gage 11              |                                    | :25              | .0094           | .8580            |
| 11-16                                                           | .08                                | .0381               | 7:30a            | 0                         |                                    | 8:15             | .0082           | .8652            |
| 11-17                                                           | .85                                | .2440 <sup>3/</sup> | 1:00p            |                           | 1.28                               | :30              | .0087           | .8673            |
| 11-18                                                           | 0                                  | .0536 <sup>2/</sup> |                  |                           |                                    | 9:00             | .0072           | .8712            |
|                                                                 |                                    |                     | 11-18-57         | Rain Gage 12              |                                    | 10:00            | .0043           | .8768            |
|                                                                 |                                    |                     | 9:15a            | 0                         | 0                                  | 12:00m           | .0038           | .8848            |
|                                                                 |                                    |                     | 1:00p            |                           | 1.11                               | 11-19-57         |                 |                  |
|                                                                 |                                    |                     |                  |                           |                                    | 4:00a            | .0025           | .8972            |
|                                                                 |                                    |                     | 11-18-57         | Rain Gage 13              |                                    | 8:00             | .0019           | .9060            |
|                                                                 |                                    |                     | 8:00a            | 0                         |                                    | 12:00n           | .0015           | .9128            |
|                                                                 |                                    |                     | 1:15p            |                           | 1.15                               | 12:00m           | .0004           | .9236            |
|                                                                 |                                    |                     | 11-18-57         | Rain Gage 14              |                                    |                  |                 |                  |
|                                                                 |                                    |                     | 7:45a            | 0                         | 0                                  |                  |                 |                  |
|                                                                 |                                    |                     | 1:15p            |                           | 1.68                               |                  |                 |                  |
| Event of April 14-15, 1958                                      |                                    |                     |                  |                           |                                    |                  |                 |                  |
| 3-15-58                                                         | 0                                  | .0006               | 4-14-58          | Rain Gage 3 <sup>2/</sup> |                                    | 4-14-58          |                 |                  |
| 3-16                                                            | 0                                  | .0005               | 8:00p            | 0                         | 0                                  | 8-30p            | .0001           | 0                |
| 3-17                                                            | .56                                | .0351               | :15              | .08                       | .02                                | 10:00            | .0002           | .0003            |
| 3-18                                                            | 0                                  | .0179               | 9:25             | .23                       | .19                                | 11:00            | .0006           | .0006            |
| 3-19                                                            | 0                                  | .0025               | :50              | .41                       | .36                                | :30              | .0020           | .0013            |
| 3-20-21                                                         | 0                                  | .0008               | 10:35            | .29                       | .58                                | 12:00m           | .0103           | .0042            |
| 3-22                                                            | .01                                | .0004               | :45              | .72                       | .70                                | 4-15-58          |                 |                  |
| 3-23                                                            | .93                                | .0417               | 11:15            | .44                       | .92                                | 12:10a           | .0426           | .0086            |
| 3-24                                                            | .04                                | .1047               | 12:00m           | .19                       | 1.04                               | :20              | .0438           | .0158            |
| 3-25                                                            | .20                                | .0143               | 4-15-58          |                           |                                    | :35              | .0516           | .0277            |
| 3-26                                                            | .47                                | .1654               | 1:15a            | .07                       | 1.13                               | :50              | .0501           | .0404            |
| 3-27                                                            | 0                                  | .0161               | :45              | .18                       | 1.18                               | 1:00             | .0575           | .0494            |
| 3-28                                                            | 0                                  | .0055               | 2:50             | .08                       | 1.26                               | :15              | .0808           | .0667            |
| 3-29                                                            | .08                                | .0021               |                  |                           |                                    | :30              | .0823           | .0871            |
| 3-30                                                            | .09                                | .0029               | 4-14-58          | Rain Gages <sup>1/</sup>  |                                    | 2:00             | .0714           | .1256            |
| 3-31                                                            | 0                                  | .0015               | 8:00             | 0                         | 0                                  | :30              | .0565           | .1576            |
| 4-2                                                             | .02                                | .0005               | :45              | .02                       | .01                                | 3:30             | .0379           | .2048            |
| 4-3                                                             | 1.93                               | 1.1270              | 9:45             | .30                       | .31                                | 4:45             | .0248           | .2426            |
| 4-4                                                             | 0                                  | .0904               | 10:45            | .45                       | .76                                | 6:00             | .0164           | .2676            |
| 4-5                                                             | 0                                  | .0179               | 11:30            | .31                       | .99                                | 8:15             | .0083           | .2937            |
| 4-6                                                             | 0                                  | .0050               | 12:00m           | .20                       | 1.09                               | 12:00n           | .0050           | .3188            |
| 4-7-8                                                           | 0                                  | .0026               | 4-15-58          |                           |                                    | 6:00p            | .0037           | .3452            |
| 4-9                                                             | .07                                | .0021               | 3:15a            | .08                       | 1.34                               | 12:00m           | .0017           | .3614            |
| 4-10                                                            | T                                  | .0021               |                  |                           |                                    | 4-16-58          |                 |                  |
| 4-11                                                            | 0                                  | .0011               | 4-14-58          | Rain Gage 9               |                                    | 12:00n           | .0007           | .3758            |
| Notes: To convert runoff in in/hr to cfs, multiply by 20,166.6. |                                    |                     |                  |                           |                                    |                  |                 |                  |
| 1/ Rain gages 3, 9, 10, 11, 12, 13, and 14 Thiessen weighted.   |                                    |                     |                  |                           |                                    |                  |                 |                  |
| 2/ Rainfall for rain gage 10 listed on page 62.12-2.            |                                    |                     |                  |                           |                                    |                  |                 |                  |
| 3/ Recessional flow prior to 10:15a.                            |                                    |                     |                  |                           |                                    |                  |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                          |                   |                 |                       |                   |               | Oxford, Mississippi Watershed W-32 |              |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-----------------------|-------------------|---------------|------------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                                           |                   |                 | Rainfall              |                   |               | Runoff                             |              |               |
| Date                                                                                                                                                                                                                                                                            | Rainfall (inches) | Runoff (inches) | Date and time         | Intensity (in/hr) | Acc. (inches) | Date and time                      | Rate (in/hr) | Acc. (inches) |
| Event of April 14-15, 1958 (Continued)                                                                                                                                                                                                                                          |                   |                 |                       |                   |               |                                    |              |               |
| 4-12-13                                                                                                                                                                                                                                                                         |                   | .0010           | 9:00p                 | 0                 | 0             | 9:00p                              | .0002        | .3803         |
| 4-14                                                                                                                                                                                                                                                                            | .002              | .0008           | 4-15-58<br>3:15a      |                   | 1.31          |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4-14-58               | Rain Gage 11      |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 8:45p                 | 0                 | 0             |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4-15-58<br>3:00a      |                   | 1.19          |                                    |              |               |
| Watershed Conditions: 23% of area under cultivation in cotton and corn - poor cover, 14% pasture, 44% idle, 11% woods - good cover, 2% bare gullies.                                                                                                                            |                   |                 | 4-14-58               | Rain Gage 12      |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 8:15p                 | 0                 | 0             |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4-15-58<br>2:45a      |                   | 1.36          |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4-14-58               | Rain Gage 13      |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 8:30p                 | 0                 | 0             |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4-15-58<br>3:00a      |                   | 1.35          |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4-14-58               | Rain Gage 14      |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 8:30p                 | 0                 | 0             |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4-15-58<br>3:00a      |                   | 1.52          |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | Event of May 22, 1959 |                   |               |                                    |              |               |
| 4-22-59                                                                                                                                                                                                                                                                         | 0                 | .0021           | 5-22-59               | Rain Gage 3       |               | 5-22-59                            |              |               |
| 4-23                                                                                                                                                                                                                                                                            |                   | .0006           | 4-23p                 | 0                 | 0             | 4:45p                              | 0            | 0             |
| 4-24                                                                                                                                                                                                                                                                            |                   | .0004           | 4:45                  | 1.20              | .20           | 6:25                               | .0000        | .0000         |
| 4-25-26                                                                                                                                                                                                                                                                         | 0                 | .0004           | 5:50                  | 3.00              | .45           | :30                                | .0065        | .0003         |
| 4-27                                                                                                                                                                                                                                                                            |                   | .0001           | 5:55                  | 1.80              | .60           | :35                                | .0271        | .0017         |
| 4-28-30                                                                                                                                                                                                                                                                         |                   | .0003           | 5:05                  | .30               | .65           | :40                                | .0590        | .0053         |
| 5-1-2                                                                                                                                                                                                                                                                           | 0                 | .0002           | 7:00                  | .07               | .79           | :50                                | .0833        | .0172         |
| 5-1-9                                                                                                                                                                                                                                                                           | 0                 |                 |                       |                   |               | 7:00                               | .0892        | .0316         |
| 5-10                                                                                                                                                                                                                                                                            | .27               |                 | 5-22-59               | Rain Gage 1       |               | :15                                | .0873        | .0536         |
| 5-11                                                                                                                                                                                                                                                                            | .27               |                 | 4:30p                 | 0                 | 0             | :50                                | .0585        | .0961         |
| 5-12                                                                                                                                                                                                                                                                            | .83               | .0001           | 4:45                  | .52               | .13           | 8:25                               | .0311        | .1222         |
| 5-13                                                                                                                                                                                                                                                                            | 0                 | .0238           | 5:00                  | 3.00              | .88           | :55                                | .0139        | .1328         |
| 5-14-15                                                                                                                                                                                                                                                                         | 0                 | .0002           | :15                   | .40               | .98           | 9:15                               | .0107        | .1349         |
| 5-16-21                                                                                                                                                                                                                                                                         | 0                 |                 | :45                   | .08               | 1.02          | 10:30                              | .0077        | .1464         |
| 5-22                                                                                                                                                                                                                                                                            | .274/             | 0               | 6:00                  | .12               | 1.05          | 11:00                              | .0070        | .1501         |
|                                                                                                                                                                                                                                                                                 |                   |                 | :30                   | .08               | 1.09          | 12:00m                             | .0054        | .1563         |
|                                                                                                                                                                                                                                                                                 |                   |                 | 7:00                  | .04               | 1.11          | 5-23-59<br>2:00a                   | .0034        | .1651         |
| Watershed Conditions: 23% of area under cultivation in cotton and corn - poor to fair cover; 14% pasture, 49% idle, 12% woods - good cover; 2% bare gullies.                                                                                                                    |                   |                 | 5-22-59               | Rain Gage 7       |               | 5:00                               | .0013        | .1723         |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4:50p                 | 0                 | 0             | 8:00                               | .0002        | .1747         |
|                                                                                                                                                                                                                                                                                 |                   |                 | 7:15                  |                   | 1.74          |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 5-22-59               | Rain Gage 11      |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4:40p                 |                   | 0             |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 6:35                  |                   | 1.01          |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 5-22-59               | Rain Gage 12      |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4:35                  |                   | 0             |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 7:00                  |                   | 1.25          |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 5-22-59               | Rain Gage 13      |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4:45p                 | 0                 | 0             |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 7:00                  |                   | 1.25          |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 5-22-59               | Rain Gage 14      |               |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 4:40p                 | 0                 | 0             |                                    |              |               |
|                                                                                                                                                                                                                                                                                 |                   |                 | 7:05                  |                   | .41           |                                    |              |               |
| <b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 20,166.6.<br>1/ Rain gages 3, 9, 10, 11, 12, 13, and 14 Thiessen weighted.<br>2/ Rainfall between 7:20a and 9:45a.<br>3/ Rainfall for rain gage 10 listed on page 62.12-3.<br>4/ Rainfall between 3:45a and 7:00a. |                   |                 |                       |                   |               |                                    |              |               |



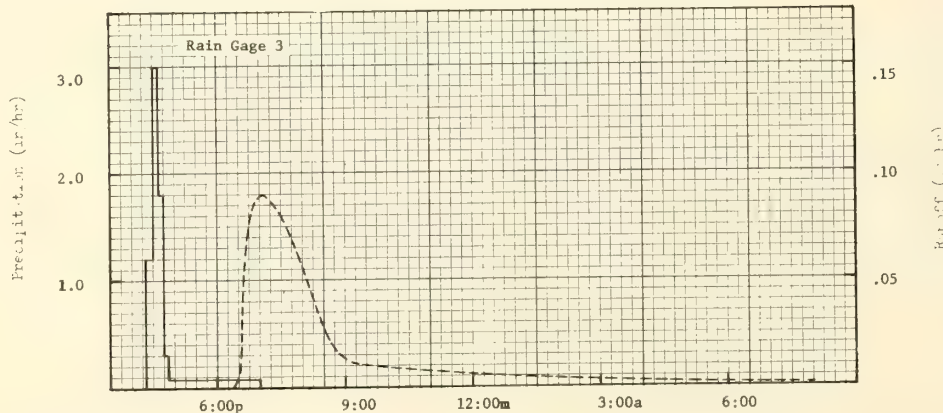


November 18, 1957



April 14, 1958

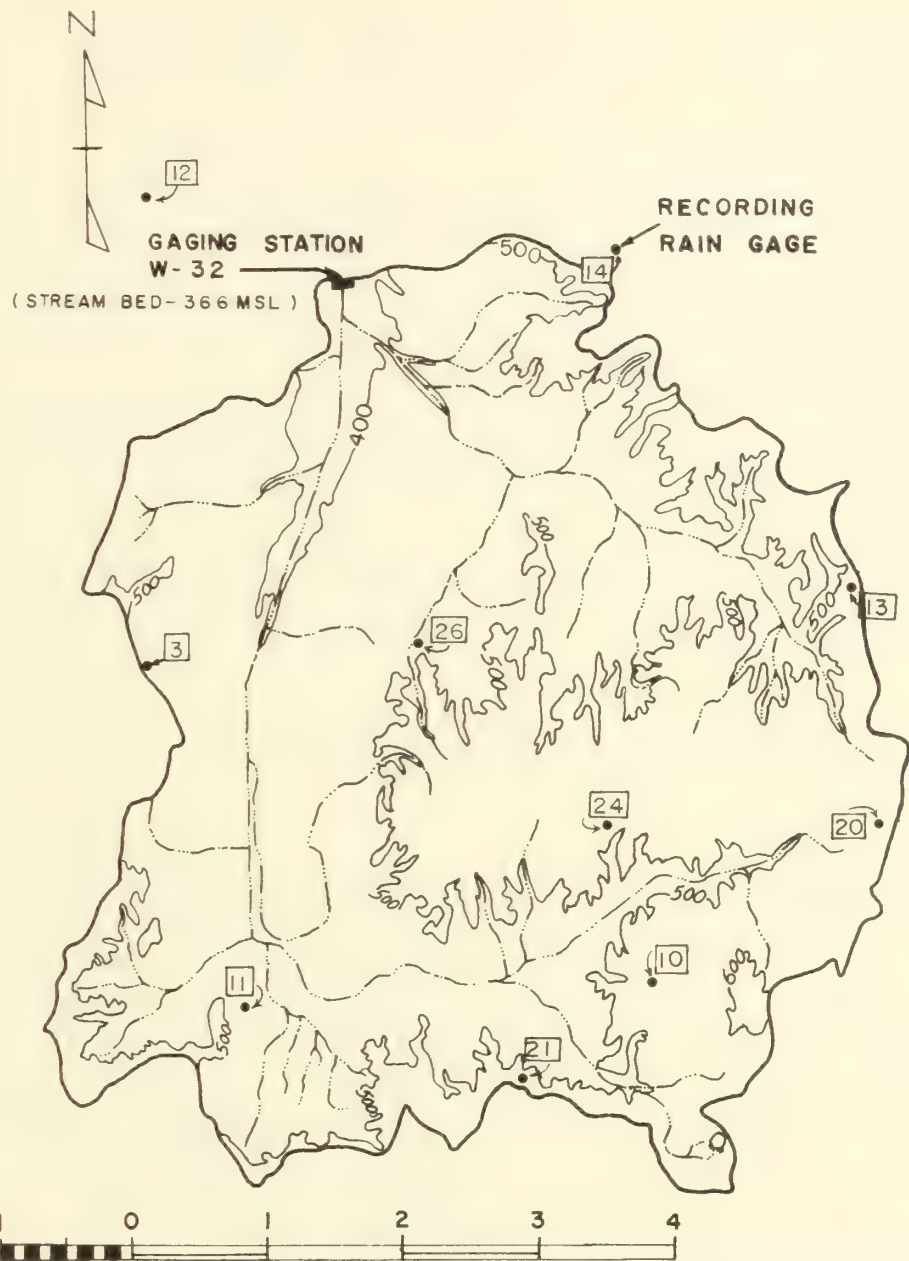
April 15, 1958



May 22, 1959

May 23, 1959

OXFORD, MISSISSIPPI WATERSHED W-32



SCALE IN MILES

CONTOUR INTERVAL-100 FEET

NOTE: FOR WATERSHED LOCATION  
SEE FIGURE 1, PAGE 62.II-5

OXFORD, MISSISSIPPI  
WATERSHED W-32  
AREA: 20,000 ACRES

OXFORD, MISSISSIPPI Watershed W-34

LOCATION: Marshall Co., Miss.; 8 mi. S. of Byhalia on county road; Pigeon Roost Creek, Yazoo River Basin.

AREA: 75,000 ac. (117.2 sq. mi.)

SHAPE: Similar to state of South Carolina. Major E-W axis 15 mi., average width about 8 mi.

SLOPES: 22% is in 0-2% class; 24% in 2-5%; 8% in 5-8%; 10% in 8-12%; 19% in 12-17%; 17% in 17% and above. Aspect W.

SOILS: Loessial and Coastal plains; topsoil - 9% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 8% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 13% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 50% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 20% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 9% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 8% slow permeability, impeding layer at 15 to 20 ins.; 13% moderate to slow permeability impeding layer at 15 to 20 ins.; 58% moderate to rapid permeability, no impeding layer; 20% moderate to moderately rapid permeability, no impeding layer. Loring silt loam - 9%; Grenada silt loam - 8%; Providence silt loam and silty clay loam - 13%; Ruston fine sandy loam - 50%; Hymon loam 20%.

EROSION: + - 20%; 2 - 18%; 3 - 62%.

LAND CAPABILITY: II - 24%; III - 12%; IV - 6%; VI - 8%; VII - 50%.

SURFACE DRAINAGE: Good; length of principal waterway - 15 mi.; main tributary (Cuffawa Creek) - 13.5 mi. long. Sand bed channels; dredged channels below gaging stations 12 and 35. Approximately 12% non-contributing area due to small desilting and retention dams, increased to 15% in 1960, principally in upper reaches of watershed.

CHARACTER OF FLOW: Perennial, continuous.

INSTRUMENTATION: Runoff - current meter rated section of dredged sand-bottom channel; continuous water-stage recorder; cableway at site. Precipitation - 31 recording gages; 15 recording gages prior to July, 1959.

WATERSHED CONDITIONS: Normally about 22% is in cultivation - cotton and corn, 42% idle - good to poor cover of broom sedge and common grasses, 13% pasture - good to poor cover; 21% in woods - good to fair cover; 2% bare gullies.

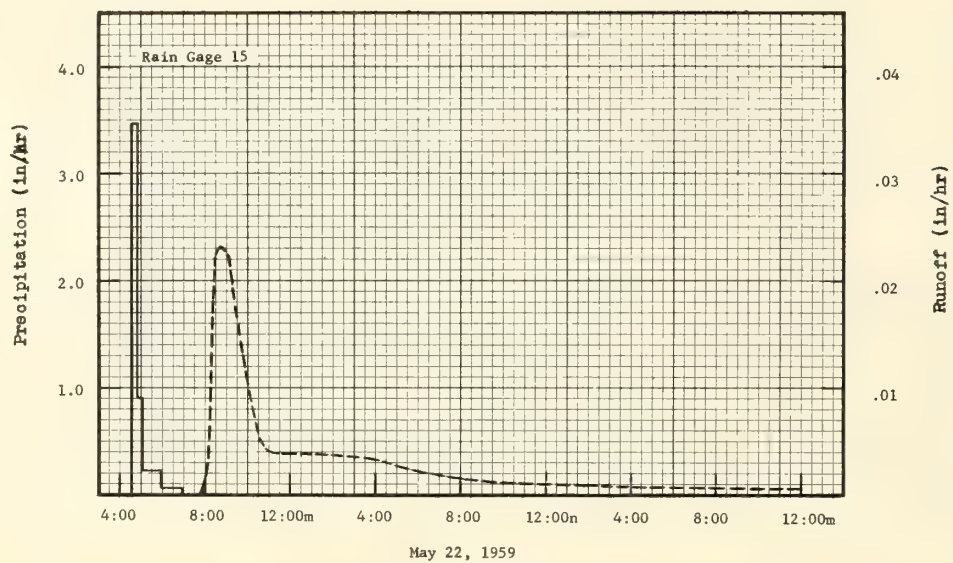
GENERALLY REPRESENTS: Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                         |                   |      |                                           |      |         |      |         |      | Oxford, Mississippi Watershed W-34<br>(Area 75,000 acres) |       |       |      |        |       |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|-----------------------------------------------------------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                     |                   | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July | Aug.                                                      | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                              | P                 | 7.92 | 6.77                                      | 2.34 | 6.83    | 5.85 | 6.77    | 2.79 | 1.73                                                      | 6.80  | 3.39  | 9.41 | 5.12   | 65.72 |        |      |
|                                                                                                                                                                   | Q                 | 2.86 | 2.64                                      | .49  | 2.11    | 1.62 | .92     | .71  | .31                                                       | 1.04  | .34   | 3.82 | 2.24   | 19.10 |        |      |
| 1958                                                                                                                                                              | P                 | 2.66 | 1.78                                      | 3.65 | 6.94    | 4.60 | 5.05    | 6.43 | 1.18                                                      | 10.20 | 0.95  | 3.39 | 1.67   | 48.50 |        |      |
|                                                                                                                                                                   | Q                 | 0.83 | .54                                       | .87  | 2.26    | 1.92 | .48     | .87  | .36                                                       | 2.24  | .33   | .55  | .49    | 11.74 |        |      |
| 1959                                                                                                                                                              | P                 | 4.18 | 4.06                                      | 3.48 | 4.15    | 4.59 | 3.64    | 4.91 | 4.73                                                      | 3.13  | 2.18  | 3.02 | 6.77   | 48.84 |        |      |
|                                                                                                                                                                   | Q                 | 1.53 | 1.47                                      | .95  | 1.02    | .64  | .71     | .55  | .55                                                       | .59   | .35   | .37  | 1.65   | 10.38 |        |      |
| Normal                                                                                                                                                            | P                 | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17 | 3.13                                                      | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                           |                   |      |                                           |      |         |      |         |      | Oxford, Mississippi Watershed W-34                        |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                              | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |                                                           |       |       |      |        |       |        |      |
|                                                                                                                                                                   |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours                                                  |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                   | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date                                                      | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                              | 11-14             | 0.07 | 11-14                                     | 0.07 | 11-14   | 0.14 | 11-14   | 0.42 | 11-13                                                     | 0.81  | 1-31  | 1-20 | 1-30   | 2.18  | 1-28   | 3.28 |
| 1958                                                                                                                                                              | 9-19              | .07  | 9-19                                      | .07  | 9-19    | .14  | 9-19    | .38  | 9-19                                                      | .64   | 9-19  | 1.17 | 9-19   | 1.50  | 4-25   | 1.77 |
| 1959                                                                                                                                                              | 12-18             | .05  | 12-18                                     | .05  | 12-18   | .10  | 12-18   | .26  | 12-18                                                     | .32   | 2-13  | .54  | 2-13   | .74   | 12-11  | 1.25 |
| Notes: Quality of records: Q - good for 1957 and 1958, good for 1959; P - good. Normal P based on 33-yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss. |                   |      |                                           |      |         |      |         |      |                                                           |       |       |      |        |       |        |      |

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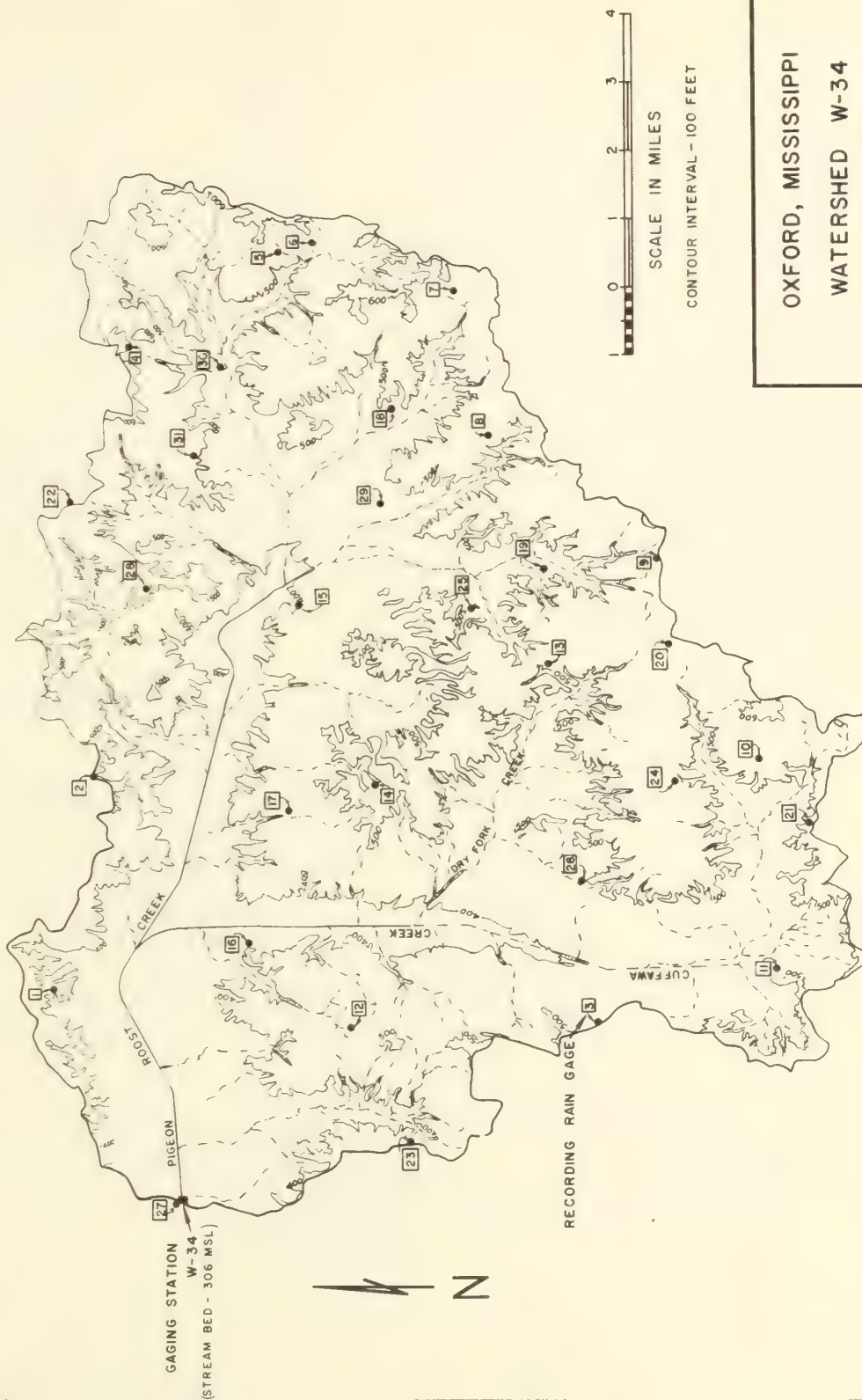
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |                    |                       |                            |                  | Oxford, Mississippi Watershed W-34 |                 |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------|-----------------------|----------------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                   |                    | Rainfall <sup>1</sup> |                            |                  | Runoff                             |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Rainfall <sup>2</sup><br>(inches) | Runoff<br>(inches) | Date and<br>time      | Intensity<br>(in/hr)       | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of May 22, 1959                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                   |                    |                       |                            |                  |                                    |                 |                  |
| 4-22-59                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0                                 | .0212              | 5-22-59               | Rain Gage 15               |                  | 5-22-59                            |                 |                  |
| 4-23-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   | .0498              | 4:35p                 | 0                          | 0                | 8:05p                              | .0006           | 0                |
| 4-26-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   | .0706              |                       | 3.48                       | .58              | :10                                | .0052           | .0002            |
| 5-1-9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                                 | .0552              | 5:05                  | .90                        | .73              | :15                                | .0089           | .0008            |
| 5-10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .20                               | .0120              | 6:00                  | .21                        | .82              | 7:30                               | .0212           | .0048            |
| 5-11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .32                               | .0120              | 7:00                  | .06                        | .88              | :40                                | .0227           | .0085            |
| 5-12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .57                               | .0168              |                       |                            |                  | :50                                | .0230           | .0123            |
| 5-13-20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   | .1147              | 5-22-59               | Rain Gage 1                |                  | 9:00                               | .0225           | .0161            |
| 5-21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                   | .0124              | 4:35p                 |                            |                  | :30                                | .0182           | .0265            |
| 5-22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .15                               | .0102              | 5:30                  | .13                        | .12              | 10:00                              | .0113           | .0339            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 6:15                  | .17                        | .25              | :15                                | .0088           | .0364            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | :30                   | .09                        | .30              | :55                                | .0039           | .0401            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    |                       |                            |                  | 12:00m                             | .0038           | .0443            |
| Watershed Conditions: 22% of area under cultivation in cotton and corn - poor to fair cover; 13% pasture, 42% idle, 21% woods - good cover, 2% bare gullies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                   |                    | 5-22-59               | Rain Gage 4                |                  | 1:45a                              | .0036           | .0508            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5:00p                 | 0                          | 0                | 3:15                               | .0034           | .0561            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | :10                   | 3.84                       | .64              | :45                                | .0032           | .0578            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | :20                   | 1.68                       | .92              | 4:30                               | .0027           | .0601            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 6:00                  | .12                        | 1.00             | 6:00                               | .0020           | .0637            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 7:00                  | .06                        | 1.06             | 9:00                               | .0012           | .0685            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    |                       |                            |                  | 12:00n                             | .0009           | .0718            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5-22-59               | Rain Gage 5                |                  | 12:00m                             | .0005           | .0802            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5:00p                 | 0                          | 0                |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | :15                   | 3.60                       | .90              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | :25                   | 1.02                       | 1.07             |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | :45                   | .15                        | 1.12             |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 6:45                  | .08                        | 1.20             |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5-22-59               | Rain Gage 8                |                  |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 4:50p                 | 0                          | 0                |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5:00                  | 4.08                       | .68              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | :10                   | 2.88                       | 1.16             |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | :30                   | .24                        | 1.24             |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 6:45                  | .08                        | 1.34             |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5-22-59               | Rain Gage 12               |                  |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 4:35p                 | 0                          | 0                |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5:30                  | .15                        | .14              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 6:15                  | .13                        | .24              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 7:00                  | .04                        | .27              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5-22-59               | Rain Gage 14 <sup>5/</sup> |                  |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 4:40p                 | 0                          | 0                |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | :55                   | 1.38                       | .23              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5:15                  | .21                        | .30              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 7:00                  | .08                        | .44              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5-22-59               | Rain Gage 2 <sup>6/</sup>  |                  |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 4:45p                 | 0                          | 0                |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 7:00                  |                            | .22              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5-22-59               | Rain Gage 3                |                  |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 4:35p                 | 0                          | 0                |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 7:01                  |                            | .79              |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5-22-59               | Rain Gage 6                |                  |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5:00p                 | 0                          | 0                |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 7:15                  |                            | 1.09             |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5-22-59               | Rain Gage 7                |                  |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 5:00p                 | 0                          | 0                |                                    |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                    | 7:15                  |                            | 1.47             |                                    |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 75,625.<br>For additional selected events see "Selected Runoff Events for Small Agricultural Watersheds in the United States," ARS-SWC, January 1960, pages 62.11-1,2,3.<br><sup>1/</sup> Isohyetal map of storm rainfall on page 62.11-5.<br><sup>2/</sup> Rain gages 1 through 15, 25, 28, and 29 Thiessen weighted.<br><sup>3/</sup> Prior to 9:30a.<br><sup>4/</sup> Recessional flow prior to runoff event.<br><sup>5/</sup> Rainfall for rain gage 3 on page 62.10-3; rain gage 13 on page 62.3-2; rain gage 10 on page 62.12-3.<br><sup>6/</sup> Rainfall for rain gages 9, 11, 12, 13, and 14 on page 62.10-3. |                                   |                    |                       |                            |                  |                                    |                 |                  |



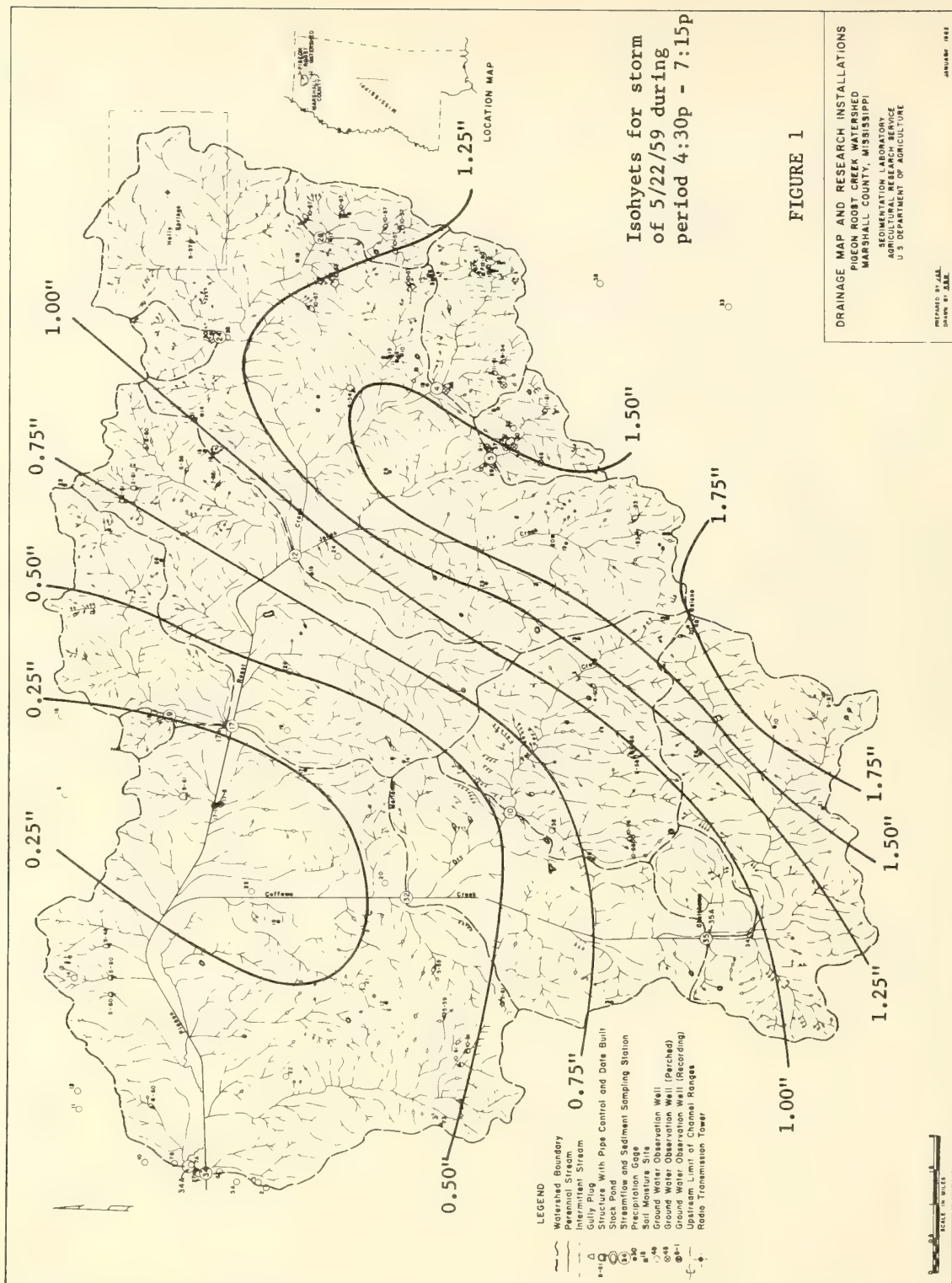


OXFORD, MISSISSIPPI WATERSHED W-34

REVISED 5-62



NOTE: FOR WATERSHED LOCATION SEE FIGURE 1, PAGE 62 II-5



OXFORD, MISSISSIPPI Watershed W-35 1/

LOCATION: Marshall Co., Miss.; 0.3 mi. W. of Chulahoma on State Highway No. 4; Cuffawa Creek, Pigeon Roost Creek Watershed, Yazoo River Basin.

AREA: 7,550 ac. (11.8 sq. mi.)

SHAPE: Rectangular; 5.4 mi. wide, 2.5 mi. long.

SLOPES: 17% is in 0-2% class; 30% in 2-5%; 7% in 5-8%; 26% in 8-12%; 16% in 12-17%; 4% in 17% and above. Aspect NW.

SOILS: Loessial over Coastal Plains; topsoil - 9% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure; 15% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 12% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 47% fine sandy loam in texture, 0 to 12 ins. in depth, weak fine crumb structure; 17% loam in texture, 0 to 21 ins. in depth, weak fine granular structure. Subsoil - 9% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 15% slow permeability, impeding layer at 15 to 20 ins.; 12% moderate to slow permeability, impeding layer at 15 to 20 ins.; 47% moderate to rapid permeability, no impeding layer; 17% moderate to moderately rapid permeability, no impeding layer; 17% moderate to moderately rapid permeability, no impeding layer. Internal drainage - medium to slow. Loring silt loam - 9%; Grenada silt loam - 15%; Providence silt loam and silty clay loam - 12%; Ruston fine sandy loam - 47%; Hymon loam - 17%.

EROSION: + - 17%; 2 - 32%; 3 - 51%.

LAND CAPABILITY: II - 28%; III - 12%; IV - 8%; VI - 4%; VII - 48%.

SURFACE DRAINAGE: Good; length of principal waterway - 5.5 mi.; sand bed channel. About 8% non-contributing area due to small desilting and retention dams.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff - current meter rated section of dredged sand-bottom channel; continuous water-stage recorder. Precipitation - five recording gages, increased to six recording gages, July, 1959.

WATERSHED CONDITIONS: Normally about 20% is in cultivation - cotton and corn, 53% idle - good to poor cover of broom sedge and common grasses, 19% pasture - good to fair cover; 6% woods - fair to poor cover; 2% bare gullies.

GENERALLY REPRESENTS: Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                         |                   |      |                                           |      |         |      |         |      | Oxford, Mississippi Watershed W-35<br>(Area - 7,550 Acres) |       |       |      |        |       |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|------------------------------------------------------------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                                                     |                   | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July | Aug.                                                       | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1957                                                                                                                                                              | P                 | 7.75 | 6.45                                      | 2.49 | 7.38    | 5.35 | 6.62    | 2.61 | 2.28                                                       | 6.84  | 3.42  | 9.80 | 4.66   | 65.65 |        |      |
|                                                                                                                                                                   | Q                 | 3.78 | 1.98                                      | .07  | 2.37    | .64  | .31     | .14  | .01                                                        | .54   | .01   | 3.99 | 1.11   | 14.95 |        |      |
| 1958                                                                                                                                                              | P                 | 2.75 | 1.91                                      | 3.87 | 8.23    | 4.86 | 4.24    | 6.01 | 0.82                                                       | 9.82  | 1.02  | 3.43 | 1.76   | 48.72 |        |      |
|                                                                                                                                                                   | Q                 | 0.58 | .18                                       | .71  | 3.55    | 1.99 | .04     | .23  | 0                                                          | 1.22  | 0     | .09  | 0      | 8.59  |        |      |
| 1959                                                                                                                                                              | P                 | 4.26 | 4.35                                      | 3.39 | 3.97    | 6.11 | 3.88    | 5.45 | 3.34                                                       | 4.65  | 1.95  | 3.03 | 6.90   | 51.28 |        |      |
|                                                                                                                                                                   | Q                 | 1.11 | 1.76                                      | .42  | .43     | .75  | .68     | .11  | .03                                                        | .81   | .01   | .02  | 2.28   | 8.41  |        |      |
| Normal                                                                                                                                                            | P                 | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17 | 3.13                                                       | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                           |                   |      |                                           |      |         |      |         |      | Oxford, Mississippi W-35                                   |       |       |      |        |       |        |      |
| YEAR                                                                                                                                                              | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |                                                            |       |       |      |        |       |        |      |
|                                                                                                                                                                   |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours                                                   |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                                                   | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date                                                       | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1957                                                                                                                                                              | 11-13             | 0.37 | 11-13                                     | 0.36 | 11-13   | 0.68 | 11-13   | 1.14 | 11-13                                                      | 1.76  | 1-31  | 2.28 | 1-30   | 3.46  | 1-27   | 4.46 |
| 1958                                                                                                                                                              | 4-3               | .49  | 4-3                                       | .45  | 4-3     | .82  | 4-3     | 1.16 | 4-3                                                        | 1.28  | 4-3   | 1.39 | 4-3    | 1.41  | 4-25   | 2.80 |
| 1959                                                                                                                                                              | 9-27              | .30  | 9-27                                      | .28  | 9-26    | .50  | 9-26    | .76  | 9-26                                                       | .78   | 2-13  | 1.00 | 12-17  | 1.29  | 12-11  | 2.08 |
| Notes: Quality of records: Q - good for 1957 and 1958, good for 1959; P - good. Normal P based on 33 yr. record (1920-1952) at USWB Sta., Holly Springs 2N, Miss. |                   |      |                                           |      |         |      |         |      |                                                            |       |       |      |        |       |        |      |
| 1/ Watershed W-35A not included.                                                                                                                                  |                   |      |                                           |      |         |      |         |      |                                                            |       |       |      |        |       |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.



| SELECTED RUNOFF EVENTS                                                                                                                     |                                    |                     |                  |                            |                  | Oxford, Mississippi Watershed W-35 |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------|------------------|----------------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                      |                                    |                     | Rainfall         |                            |                  | Runoff                             |                 |                  |
| Date                                                                                                                                       | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches)  | Date and<br>time | Intensity<br>(in/hr)       | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of November 18, 1957                                                                                                                 |                                    |                     |                  |                            |                  |                                    |                 |                  |
| 10-19-57                                                                                                                                   | 0                                  | 0                   | 11-18-57         | Rain Gage 10 <sup>2/</sup> |                  | 11-18-57                           |                 |                  |
| 10-20-21                                                                                                                                   | 0                                  | 0                   | 10:15a           | 0                          | 0                | 10:15a                             | .0058           | 0                |
| 10-22                                                                                                                                      | .88                                | 0                   | :30              | .16                        | .04              | :45                                | .0105           | .0020            |
| 10-23                                                                                                                                      | .91                                | .0126               | :45              | 2.24                       | .60              | :50                                | .0152           | .0031            |
| 10-24-28                                                                                                                                   | 0                                  | 0                   | :55              | .90                        | .75              | :55                                | .0633           | .0064            |
| 10-29                                                                                                                                      | .08                                | 0                   | 12:00n           | .24                        | 1.01             | 11:00                              | .0969           | .0131            |
| 10-30                                                                                                                                      | .26                                | 0                   | 1:15             | .07                        | 1.10             | :15                                | .1458           | .0435            |
| 10-31                                                                                                                                      | T                                  | 0                   | :25              | .48                        | 1.18             | :45                                | .2023           | .1306            |
| 11-1-2                                                                                                                                     | 0                                  | 0                   |                  |                            |                  | 12:00n                             | .2272           | .1842            |
| 11-3                                                                                                                                       | .18                                | 0                   | 11-18-57         | Rain Gages <sup>1/</sup>   |                  | :15p                               | .2325           | .2416            |
| 11-4-6                                                                                                                                     | 0                                  | 0                   | 7:45a            | 0                          | 0                | :30                                | .2220           | .2984            |
| 11-7                                                                                                                                       | .58                                | .0504               | 8:30             | .03                        | .02              | :45                                | .2010           | .3512            |
| 11-8                                                                                                                                       | 1.16                               | .3531               | 9:15             | 0                          | .02              | 1:00                               | .1799           | .3988            |
| 11-9-11                                                                                                                                    | 0                                  | 0                   | 10:15            | .03                        | .03              | :45                                | .1122           | .5083            |
| 11-12                                                                                                                                      | .45                                | 0                   | :45              | 1.34                       | .67              | 2:30                               | .0755           | .5784            |
| 11-13                                                                                                                                      | 2.66                               | 1.2420              | 12:00n           | .31                        | 1.09             | 3:30                               | .0478           | .6376            |
| 11-14                                                                                                                                      | .38                                | .7093               | 1:30p            | .10                        | 1.24             | 4:00                               | .0405           | .6598            |
| 11-15                                                                                                                                      | .23                                | .0180               |                  |                            |                  | :30                                | .0361           | .6788            |
| 11-16                                                                                                                                      | .08                                | .0851               |                  |                            |                  | 5:00                               | .0318           | .6958            |
| 11-17                                                                                                                                      | .72                                | .2396               |                  |                            |                  | 6:30                               | .0194           | .7342            |
| 11-18                                                                                                                                      | 0                                  | .0943 <sup>3/</sup> |                  |                            |                  | 9:00                               | .0092           | .7699            |
|                                                                                                                                            |                                    |                     |                  |                            |                  | 12:00m                             | .0050           | .7912            |
|                                                                                                                                            |                                    |                     |                  |                            |                  | 11-19-58                           |                 |                  |
|                                                                                                                                            |                                    |                     |                  |                            |                  | 3:00a                              | .0030           | .8032            |
| Watershed Conditions: 23% in cotton and corn residue - fair cover; 14% pasture, 49% idle, 12% woods - fair to good cover; 2% bare gullies. |                                    |                     |                  |                            |                  |                                    |                 |                  |
| Event of April 14-15, 1958                                                                                                                 |                                    |                     |                  |                            |                  |                                    |                 |                  |
| 3-15-58                                                                                                                                    | 0                                  | 0                   | 4-14-58          | Rain Gage 10 <sup>4/</sup> |                  | 4-14-58                            |                 |                  |
| 3-16                                                                                                                                       | 0                                  | 0                   | 8:40p            | 0                          | 0                | 11:15p                             | 0               | 0                |
| 3-17                                                                                                                                       | .50                                | .0277               | 9:40             | .23                        | .23              | :20                                | .0021           | .0001            |
| 3-18                                                                                                                                       | 0                                  | .0047               | :55              | 1.08                       | .32              | :30                                | .0084           | .0010            |
| 3-19-21                                                                                                                                    | 0                                  | 0                   | 10:05            | .78                        | .45              | 12:00m                             | .0447           | .0143            |
| 3-22                                                                                                                                       | T                                  | 0                   | 11:25            | .38                        | .95              | 4-15-58                            |                 |                  |
| 3-23                                                                                                                                       | .94                                | .0820               | 12:00m           | .15                        | 1.04             | :15a                               | .0628           | .0278            |
| 3-24                                                                                                                                       | .05                                | .1040               | 4-15-58          |                            |                  | :30                                | .0875           | .0468            |
| 3-25                                                                                                                                       | .18                                | .0205               | 2:25a            | .07                        | 1.22             | :45                                | .1106           | .0716            |
| 3-26                                                                                                                                       | .47                                | .2081               | 3:00             | .14                        | 1.30             | :55                                | .1135           | .0909            |
| 3-27                                                                                                                                       | 0                                  | .0284               | 4-14-58          | Rain Gages <sup>1/</sup>   |                  | 1:15                               | .1093           | .1282            |
| 3-28                                                                                                                                       | 0                                  | .0132               | 8:30 p           | 0                          | 0                | 2:00                               | .0891           | .1992            |
| 3-29                                                                                                                                       | .07                                | .0028               | :45              | T                          | 0                | 3:00                               | .0638           | .2757            |
| 3-30                                                                                                                                       | .07                                | .0025               | 9:45             | .26                        | .26              | 4:00                               | .0402           | .3277            |
| 3-31                                                                                                                                       | 0                                  | 0                   | 11:00            | .42                        | .78              | 5:00                               | .0288           | .3622            |
| 4-1                                                                                                                                        | 0                                  | 0                   | 12:00m           | .26                        | 1.04             | 6:00                               | .0194           | .3863            |
| 4-2                                                                                                                                        | T                                  | 0                   |                  |                            |                  | 8:00                               | .0095           | .4153            |
| 4-3                                                                                                                                        | 2.39                               | 1.3114              | 4-15-58          |                            |                  | 11:00                              | .0056           | .4381            |
| 4-4                                                                                                                                        | 0                                  | .0946               | :30a             | .12                        | 1.10             | 2:00p                              | .0046           | .4534            |
| 4-5                                                                                                                                        | 0                                  | .0019               | 2:15             | .06                        | 1.20             | 6:00                               | .0033           | .4694            |
|                                                                                                                                            |                                    |                     | 3:00             | .13                        | 1.30             |                                    |                 |                  |
| 4-6                                                                                                                                        | 0                                  | .0013               |                  |                            |                  | 12:00m                             | .0014           | .4838            |
| 4-7                                                                                                                                        | 0                                  | .0003               |                  |                            |                  |                                    |                 |                  |
| 4-8                                                                                                                                        | 0                                  | 0                   |                  |                            |                  |                                    |                 |                  |
| 4-9                                                                                                                                        | .08                                | 0                   |                  |                            |                  |                                    |                 |                  |
| 4-10-13                                                                                                                                    | 0                                  | 0                   |                  |                            |                  |                                    |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 7,612.9.                                                                             |                                    |                     |                  |                            |                  |                                    |                 |                  |
| 1/ Rain gages 3, 9, 10, 11, and 13 Thiessen weighted.                                                                                      |                                    |                     |                  |                            |                  |                                    |                 |                  |
| 2/ Rainfall for rain gages 3, 9, 11, and 13 listed on page 62.10-2.                                                                        |                                    |                     |                  |                            |                  |                                    |                 |                  |
| 3/ Recessional flow prior to 10:15a.                                                                                                       |                                    |                     |                  |                            |                  |                                    |                 |                  |
| 4/ Rainfall for rain gages 3, 9, 11, and 13 listed on pages 62.10-2,3.                                                                     |                                    |                     |                  |                            |                  |                                    |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                                                                       |                                    |                    |                  |                            |                  | Oxford, Mississippi Watershed W-35 |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------|------------------|----------------------------|------------------|------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                        |                                    |                    | Rainfall         |                            |                  | Runoff                             |                 |                  |
| Date                                                                                                                                                         | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr)       | Acc.<br>(inches) | Date and<br>time                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of April 14-15, 1958 (Continued)                                                                                                                       |                                    |                    |                  |                            |                  |                                    |                 |                  |
| 4-14                                                                                                                                                         | .18 <sup>2/</sup>                  | 0                  |                  |                            |                  |                                    |                 |                  |
| Watershed Conditions: 23% of area under cultivation in cotton and corn - poor cover; 14% pasture, 49% idle, 12% woods - good cover; 2% bare gullies.         |                                    |                    |                  |                            |                  |                                    |                 |                  |
| Event of May 22-23, 1959                                                                                                                                     |                                    |                    |                  |                            |                  |                                    |                 |                  |
| 4-22-59                                                                                                                                                      | 0                                  | .0005              | 5-22-59          | Rain Gage 10 <sup>3/</sup> |                  | 5-22-59                            |                 |                  |
| 4-23                                                                                                                                                         | 0                                  | .0002              | 4:45p            | 0                          | 0                | 4:40p                              | 0               | 0                |
| 4-24-30                                                                                                                                                      | 0                                  | 0                  | :55              | 6.90                       | 1.15             | :45                                | .0011           | .0001            |
| 5-1-9                                                                                                                                                        | 0                                  | 0                  | 5:00             | 3.00                       | 1.40             | 5:30                               | .0005           | .0007            |
| 5-10                                                                                                                                                         | .32                                | 0                  | :05              | 2.16                       | 1.58             | :45                                | .0194           | .0032            |
| 5-11                                                                                                                                                         | .16                                | 0                  | :15              | .42                        | 1.65             | 6:00                               | .0998           | .0181            |
| 5-12                                                                                                                                                         | 1.16                               | .0221              | 6:00             | .12                        | 1.74             | :15                                | .1602           | .0506            |
| 5-13                                                                                                                                                         | 0                                  | .0158              | :50p             | .08                        | 1.81             | :30                                | .1708           | .0921            |
| 5-14-21                                                                                                                                                      | 0                                  | 0                  |                  |                            |                  | :45                                | .1524           | .1324            |
| 5-22                                                                                                                                                         | .30 <sup>4/</sup>                  | 0                  | 5-22-59          | Rain Gages <sup>1/</sup>   |                  | 7:00                               | .1300           | .1677            |
| Watershed Conditions: 23% of area under cultivation in cotton and corn - poor to fair cover; 14% pasture, 49% idle, 12% woods - good cover; 2% bare gullies. |                                    |                    |                  |                            |                  |                                    |                 |                  |
|                                                                                                                                                              |                                    |                    | 4:30p            | 0                          | 0                | :30                                | .0821           | .2207            |
|                                                                                                                                                              |                                    |                    | :45              | .52                        | .13              | 8:00                               | .0428           | .2519            |
|                                                                                                                                                              |                                    |                    | 5:00             | 4.04                       | 1.14             | :45                                | .0167           | .2734            |
|                                                                                                                                                              |                                    |                    | :15              | .72                        | 1.32             | 10:00                              | .0077           | .2864            |
|                                                                                                                                                              |                                    |                    | 6:15             | .10                        | 1.42             | :30                                | .0050           | .2896            |
|                                                                                                                                                              |                                    |                    | 7:00             | .08                        | 1.46             | 12:00m                             | .0026           | .2953            |
|                                                                                                                                                              |                                    |                    |                  |                            |                  | 5-23-59                            |                 |                  |
|                                                                                                                                                              |                                    |                    |                  |                            |                  | 6:00a                              | .0002           | .3037            |

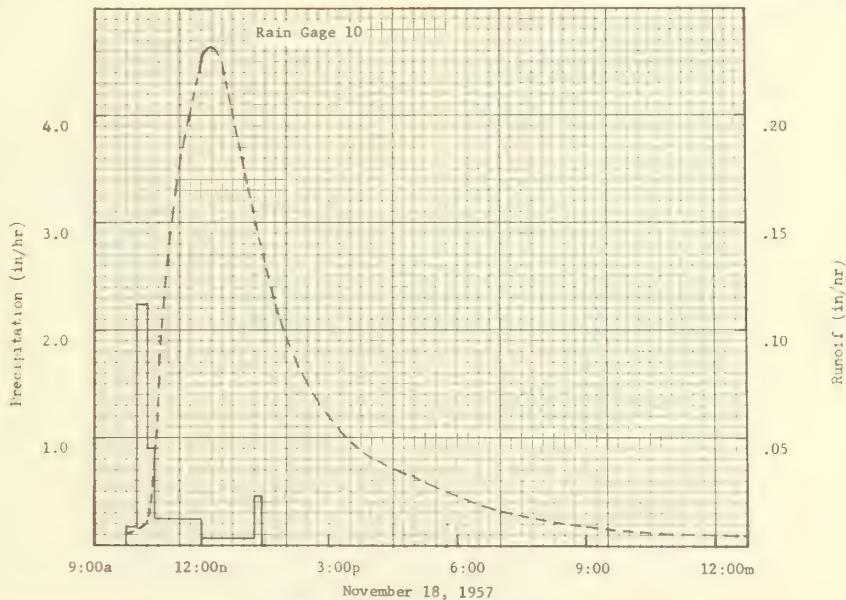
Rain Gage 10

9:00a 12:00n 3:00p 6:00 9:00 12:00m

November 18, 1957

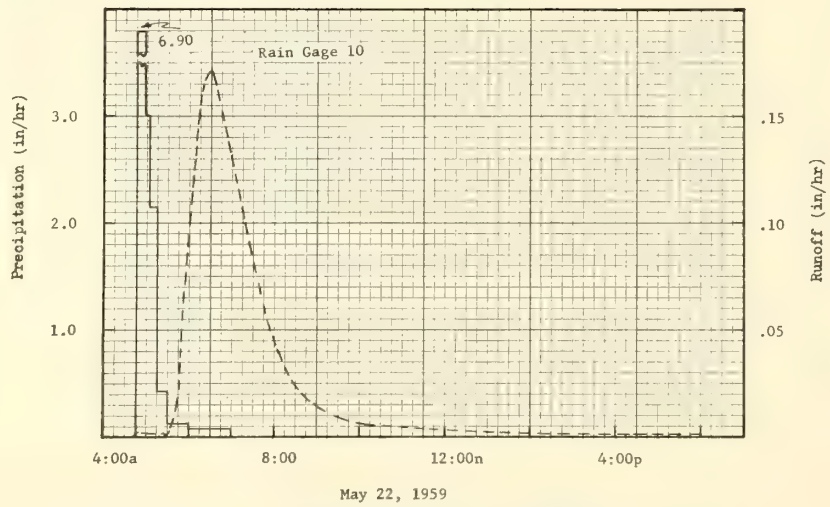
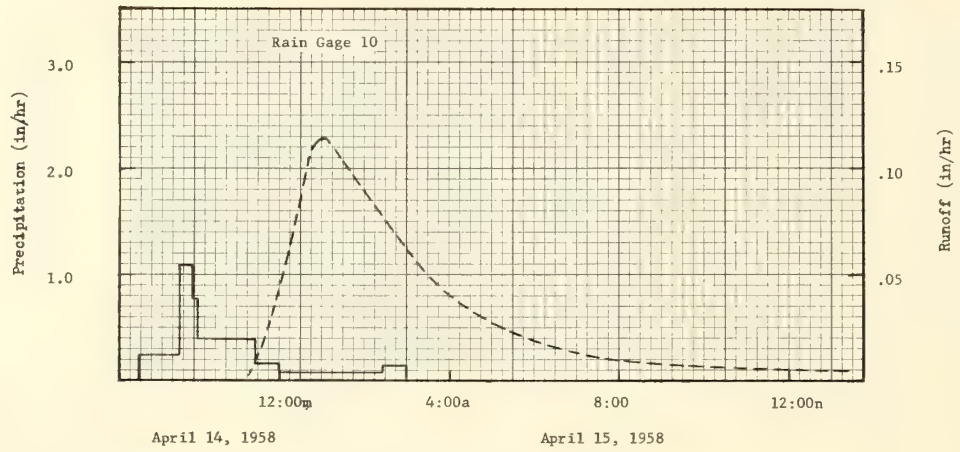
OXFORD, MISSISSIPPI WATERSHED W-35

Notes: To convert runoff in in/hr to cfs, multiply by 7,612.9.  
1/ Rain gages 3, 9, 10, 11, and 13 Thiessen weighted.  
2/ Rainfall between 7:20a and 9:45a.  
3/ Rainfall for rain gages 3, 9, 11, and 13 listed on pages 62.10-3.  
4/ Rainfall between 3:45a and 7:00a.

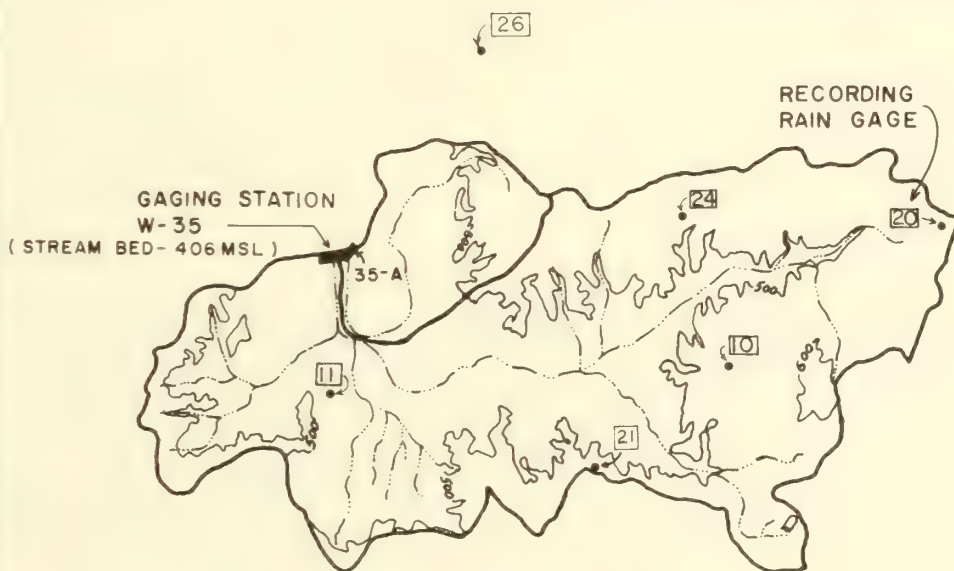


OXFORD, MISSISSIPPI WATERSHED W-35

Notes: To convert runoff in in/hr to cfs, multiply by 7,612.9.  
1/ Rain gages 3, 9, 10, 11, and 13 Thiessen weighted.  
2/ Rainfall between 7:20a and 9:45a.  
3/ Rainfall for rain gages 3, 9, 11, and 13 listed on pages 62.10-3.  
4/ Rainfall between 3:45a and 7:00a.



OXFORD, MISSISSIPPI WATERSHED W-35



SCALE IN MILES

CONTOUR INTERVAL-100 FEET

NOTE: FOR WATERSHED LOCATION  
SEE FIGURE 1, PAGE 62.11-5

OXFORD, MISSISSIPPI

WATERSHED W-35

AREA: 7,550 ACRES

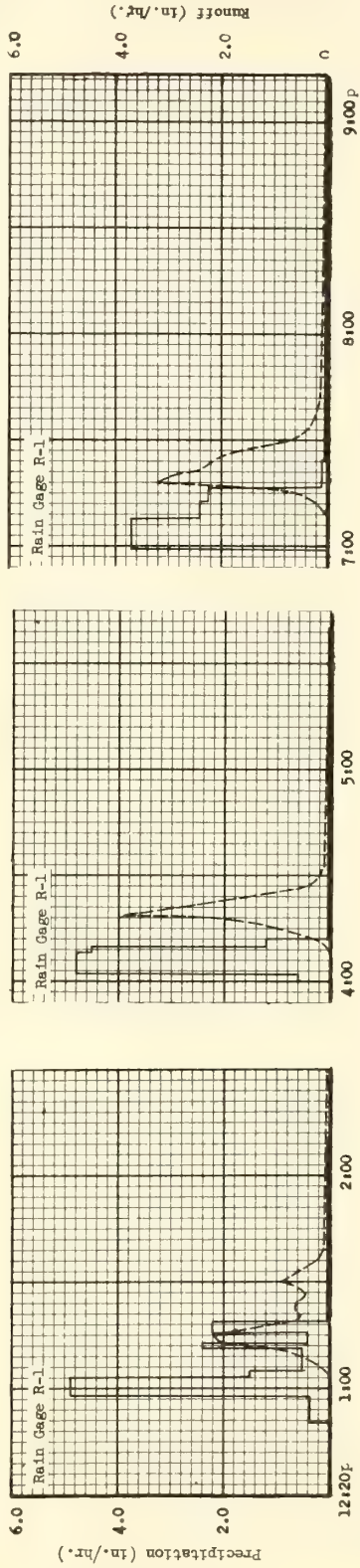


OXFORD, MISSISSIPPI Watershed WC-1LOCATION: North Mississippi Branch Experiment Station, Holly Springs, Miss.AREA: 3.88 ac.SHAPE: Roughly fan shape, 328 ft. radius.SLOPES: 8% is in 2-5% class; 49% in 5-8%; 43% in 8-12%. Aspect NE.SOILS: Loessial and Coastal Plains; topsoil - silt loam in texture, 0 to 8 ins. in depth, weak to moderate fine granular structure. Subsoil - slow to moderately permeable, impeding layer at 15 to 20 ins. Internal drainage - medium to slow. Providence silt loam to silty clay loam - 100%.EROSION: 1-20%; 2-50%; 3-30%.LAND CAPABILITY: III-50%; IV-40%; V-10%.SURFACE DRAINAGE: Good; Small earth dam at measuring station to funnel all surface runoff into flume. Length of principal waterway - 490 ft.CHARACTER OF FLOW: Ephemeral - continuous.INSTRUMENTATION: Runoff - two ft. Parshall flume and water stage recorder; Precipitation - recording gage.WATERSHED CONDITIONS: Cultivated in corn continuously since 1957. Poor management - row slope from approximate contour to up and down hill, no terraces, 4000 to 6000 plants per acre, low fertilization. Winter cover consists of shredded corn stalks, dead grass and weeds.GENERALLY REPRESENTS: Cultivated areas with moderate to steep slopes in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

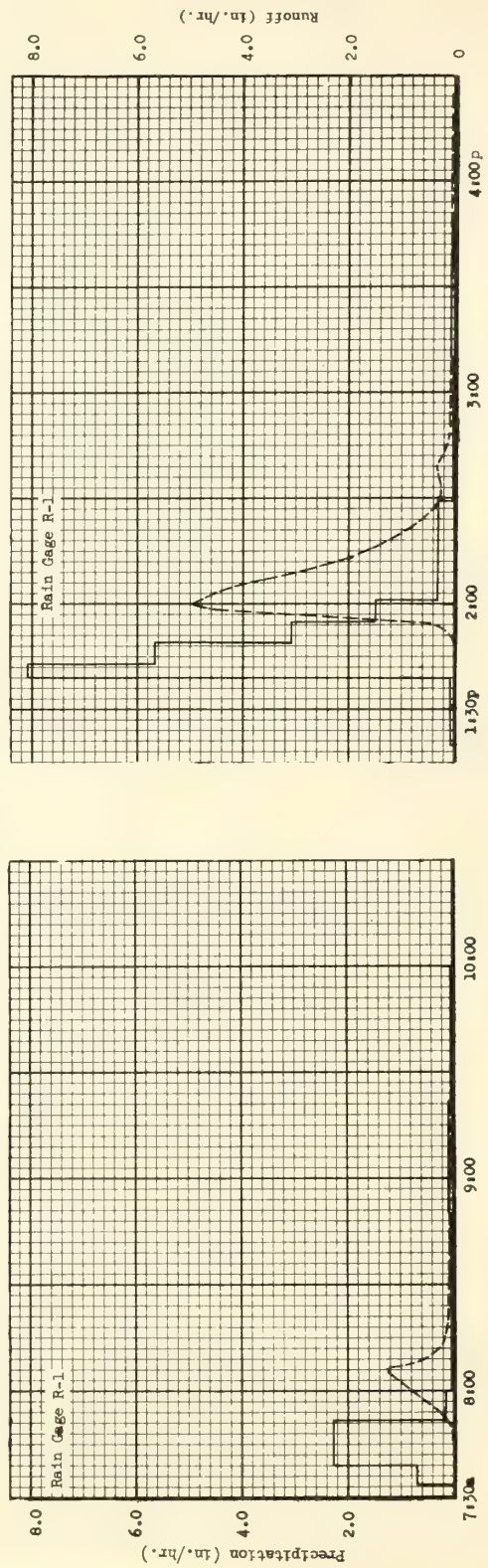
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                 |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed WC-1 |          |       |       |      |        |       |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------------------------------------|----------|-------|-------|------|--------|-------|--------|------|
| Month<br>Year                                                                                                                             |                   | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July                               | Aug.     | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1958                                                                                                                                      | P                 | 2.43 | 1.27                                      | 3.48 | 6.65    | 4.89 | 3.89    | 5.54                               | 2.60     | 8.12  | 0.96  | 3.40 | 1.65   | 44.88 |        |      |
|                                                                                                                                           | Q                 | 0.57 | 0.10                                      | 0.73 | 1.09    | 1.96 | 0.09    | 0.79                               | 0.48     | 2.20  | 0.01  | 0.76 | 0.04   | 8.82  |        |      |
| 1959                                                                                                                                      | P                 | 3.79 | 3.87                                      | 3.07 | 3.46    | 6.05 | 5.92    | 3.13                               | 4.94     | 2.08  | 2.51  | 3.13 | 6.54   | 48.49 |        |      |
|                                                                                                                                           | Q                 | 1.22 | 0.83                                      | 0.49 | 0.22    | 2.81 | 2.82    | 0.20                               | 1.25     | 0.57  | 0.32  | 0.45 | 2.65   | 13.83 |        |      |
| Normal P                                                                                                                                  |                   | 6.30 | 4.90                                      | 6.28 | 4.82    | 4.26 | 4.15    | 4.17                               | 3.13     | 3.48  | 3.19  | 4.78 | 5.25   | 54.71 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                   |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed WC-1 |          |       |       |      |        |       |        |      |
| YEAR                                                                                                                                      | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                    |          |       |       |      |        |       |        |      |
|                                                                                                                                           |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                    | 12 hours |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                                           | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                               | Date     | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1958                                                                                                                                      | 9-19              | 1.02 | 9-19                                      | 0.50 | 9-19    | 0.55 | 9-19    | 1.12                               | 9-19     | 1.41  | 9-19  | 1.99 | 9-19   | 2.12  | 9-16   | 2.16 |
| 1959                                                                                                                                      | 6-11              | 4.96 | 6-11                                      | 1.43 | 6-11    | 1.51 | 6-11    | 1.57                               | 6-11     | 2.00  | 6-11  | 2.00 | 6-10   | 2.76  | 6-9    | 2.82 |
| Notes: Quality of records: Q-good, P-good. Normal P based on 33-yr. record (1920 - 1952) at USWB station, Holly Springs 2 N, Mississippi. |                   |      |                                           |      |         |      |         |                                    |          |       |       |      |        |       |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                 |                      |                    |                        |                      |                  | Oxford, Mississippi Watershed WC-1<br>Area - 3.86 acres |                 |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------------|----------------------|------------------|---------------------------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                  |                      |                    | Rainfall               |                      |                  | Runoff                                                  |                 |                  |
| Date                                                                                                                                                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time       | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                                        | Rate<br>(in/hr) | Acc.<br>(inches) |
| Rain Gage R-1                                                                                                                                                                                                          |                      |                    | Event of May 26, 1959  |                      |                  |                                                         |                 |                  |
| 5-10-59                                                                                                                                                                                                                | .24                  | 0                  | 5-26-59                | Raingage R-i         |                  | 5-26-59                                                 |                 |                  |
| 5-11                                                                                                                                                                                                                   | .29                  | 0                  | 12:50p                 | 0                    | 0                | 1:04p                                                   | 0               | 0                |
| 5-12,13                                                                                                                                                                                                                | .05                  | 0                  | :58                    | 0.38                 | 0.05             | :10                                                     | .698            | .02              |
| 5-22                                                                                                                                                                                                                   | 1.83                 | .75                | 1:03                   | 4.92                 | .46              | :13                                                     | 2.173           | .09              |
| 5-25                                                                                                                                                                                                                   | .63                  | .37                | :05                    | 1.50                 | .51              | :15                                                     | 2.173           | .16              |
|                                                                                                                                                                                                                        |                      |                    | :11                    | .50                  | .56              | :20                                                     | .573            | .28              |
|                                                                                                                                                                                                                        |                      |                    | :13                    | 2.40                 | .64              | :22                                                     | .634            | .31              |
|                                                                                                                                                                                                                        |                      |                    | :16                    | .40                  | .66              | :24                                                     | .634            | .33              |
|                                                                                                                                                                                                                        |                      |                    | :19                    | 2.20                 | .77              | :26                                                     | .458            | .34              |
|                                                                                                                                                                                                                        |                      |                    | 2:10                   | .01                  | .78              | :30                                                     | .879            | .39              |
|                                                                                                                                                                                                                        |                      |                    | 4:00                   | 0                    | .78              | :32                                                     | .698            | .41              |
|                                                                                                                                                                                                                        |                      |                    | :02                    | .60                  | .80              | :40                                                     | .120            | .45              |
|                                                                                                                                                                                                                        |                      |                    | :08                    | 4.80                 | 1.28             | 2:20                                                    | .026            | .49              |
|                                                                                                                                                                                                                        |                      |                    | :10                    | 4.50                 | 1.43             | :52                                                     | .005            | .49              |
|                                                                                                                                                                                                                        |                      |                    | :12                    | 1.20                 | 1.47             | 3:20                                                    | 0               | .49              |
|                                                                                                                                                                                                                        |                      |                    | 5:40                   | .02                  | 1.49             | 4:08                                                    | 0               | .49              |
|                                                                                                                                                                                                                        |                      |                    | 6:59                   | 0                    | 1.49             | :10                                                     | .013            | .49              |
|                                                                                                                                                                                                                        |                      |                    | 7:08                   | 3.73                 | 2.05             | :14                                                     | .698            | .51              |
|                                                                                                                                                                                                                        |                      |                    | :13                    | 2.40                 | 2.25             | :18                                                     | 2.582           | .61              |
|                                                                                                                                                                                                                        |                      |                    | :17                    | 2.25                 | 2.40             | :19                                                     | 3.911           | .67              |
|                                                                                                                                                                                                                        |                      |                    | :25                    | .08                  | 2.41             | :20                                                     | 3.067           | .72              |
|                                                                                                                                                                                                                        |                      |                    | 9:15                   | .03                  | 2.47             | :24                                                     | 1.447           | .90              |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :32                                                     | .143            | .95              |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 5:00                                                    | .049            | .99              |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :28                                                     | .020            | 1.01             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 6:20                                                    | 0               | 1.01             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 7:08                                                    | 0               | 1.01             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :16                                                     | .925            | 1.05             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :18                                                     | 3.221           | 1.11             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :20                                                     | 2.888           | 1.21             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :28                                                     | 1.447           | 1.49             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :36                                                     | .238            | 1.56             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 8:20                                                    | .066            | 1.65             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 9:00                                                    | .026            | 1.68             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 10:40                                                   | 0               | 1.69             |
| Rain Gage R-1                                                                                                                                                                                                          |                      |                    | Event of June 11, 1959 |                      |                  |                                                         |                 |                  |
| 5-11-59                                                                                                                                                                                                                | 0.29                 | 0                  | 6-11-59                | Raingage R-1         |                  | 6-11-59                                                 |                 |                  |
| 5-12,13                                                                                                                                                                                                                | .05                  | 0                  | 7:34a                  | 0                    | 0                | 7:46a                                                   | 0               | 0                |
| 5-22                                                                                                                                                                                                                   | 1.83                 | 0.75               | :39                    | 0.72                 | 0.06             | :52                                                     | .120            | --               |
| 5-25                                                                                                                                                                                                                   | .63                  | .37                | :52                    | 2.31                 | .56              | 8:00                                                    | .810            | 0.06             |
| 5-26                                                                                                                                                                                                                   | 2.47                 | 1.69               | 8:00                   | .15                  | .58              | :05                                                     | 1.255           | .14              |
| 5-30                                                                                                                                                                                                                   | .54                  | .01                | :50                    | .01                  | .59              | :06                                                     | 1.201           | .17              |
| 6-7                                                                                                                                                                                                                    | .09                  | 0                  | 9:22                   | .09                  | .64              | :09                                                     | .514            | .21              |
| 6-8                                                                                                                                                                                                                    | .50                  | 0                  | 10:00                  | .02                  | .65              | :24                                                     | .107            | .26              |
| 6-9                                                                                                                                                                                                                    | 1.01                 | .06                | 1:20p                  | 0                    | .65              | 11:06                                                   | .020            | .42              |
| 6-10                                                                                                                                                                                                                   | 1.49                 | .76                | :39                    | .09                  | .68              | 1:00p                                                   | 0               | .43              |
|                                                                                                                                                                                                                        |                      |                    | :43                    | 8.10                 | 1.22             | :49                                                     | 0               | .43              |
|                                                                                                                                                                                                                        |                      |                    | :49                    | 5.70                 | 1.79             | :54                                                     | .383            | .44              |
|                                                                                                                                                                                                                        |                      |                    | :55                    | 3.10                 | 2.10             | :57                                                     | 3.246           | .49              |
|                                                                                                                                                                                                                        |                      |                    | 2:01                   | 1.50                 | 2.25             | 2:00                                                    | 4.959           | .72              |
|                                                                                                                                                                                                                        |                      |                    | :29                    | .36                  | 2.42             | :01                                                     | 4.856           | .80              |
|                                                                                                                                                                                                                        |                      |                    | 3:10                   | .01                  | 2.43             | :06                                                     | 3.834           | 1.17             |
|                                                                                                                                                                                                                        |                      |                    | :35                    | .10                  | 2.47             | :10                                                     | 2.812           | 1.38             |
|                                                                                                                                                                                                                        |                      |                    | :50                    | .08                  | 2.49             | :13                                                     | 2.045           | 1.51             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :17                                                     | 1.534           | 1.62             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :22                                                     | .764            | 1.72             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :25                                                     | .475            | 1.76             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :31                                                     | .253            | 1.79             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :39                                                     | .383            | 1.82             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | :51                                                     | .120            | 1.86             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 3:37                                                    | .066            | 1.88             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 4:24                                                    | .066            | 1.89             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 4:36                                                    | .059            | 1.90             |
|                                                                                                                                                                                                                        |                      |                    |                        |                      |                  | 8:00                                                    | 0               | 2.00             |
| <p>Watershed Conditions: 100% of area was in corn, 6 to 10 inches high. About 8000 plants per acre with sparse weeds and grasses. No tillage operation since planting on April 29. Planted on approximate contour.</p> |                      |                    |                        |                      |                  |                                                         |                 |                  |
| <p>Watershed Conditions: 100% of area was in corn, 10 to 15 inches high. About 8000 plants per acre with considerable weeds and grasses. Last tillage operation was on June 3. Cultivated on approximate contour.</p>  |                      |                    |                        |                      |                  |                                                         |                 |                  |
| <p>Notes: To convert runoff in in./hr. to cfs, multiply by 3.912.<br/>For watershed map, see page 62.16-4</p>                                                                                                          |                      |                    |                        |                      |                  |                                                         |                 |                  |



May 26, 1959



June 11, 1959

OXFORD, MISSISSIPPI WATERSHED WC-1



OXFORD, MISSISSIPPI Watershed WC-2LOCATION: North Mississippi Branch Experiment Station, Holly Springs, Miss.AREA: 1.45 ac.SHAPE: Roughly round, 140 ft. radius.SLOPES: 3% in 0 to 2' class, 40% in 2-5'; 5% in 8-12'. Aspect E.

SOILS: Loessial and Coastal Plains; topsoil - 15% silt loam in texture, 0 to 7 ins. in depth, weak fine granular structure, 44% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure, 41% fine sandy loam, 0 to 12 ins. in depth, weak fine crumb structure. Subsoil - 15% moderate to moderately slow permeability, impeding layer at approximately 30 ins.; 44% moderate to slow permeability, impeding layer at 15 to 20 ins., 41% moderate to rapid permeability, no impeding layer. Internal drainage - medium to rapid. Loring silt loam - 15%; Providence silt loam to silty clay loam - 44%; Ruston fine sandy loam - 41%.

EROSION: 1-30%; 2-40%; 3-30%.LAND CAPABILITY: II-30%; III-30%; IV-30%; V-10%.

SURFACE DRAINAGE: Good; Small earth dam at measuring station to funnel all surface runoff into flume. Length of principal waterway - 300 ft.

CHARACTER OF FLOW: Ephemeral - continuous.INSTRUMENTATION: Runoff - two ft. Parshall flume and water stage recorder; Precipitation - recording gage.

WATERSHED CONDITIONS: Cultivated in corn continuously since 1957. Improved management - 0.2 to 0.4% row slope, no terraces, 10,000 to 12,000 plants per acre, high fertilization, no winter crop. Winter cover consists of shredded corn stalks, dead grass, and weeds.

GENERALLY REPRESENTS: Cultivated areas with moderate to steep slopes in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                 |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed WC-2 |          |      |       |      |        |      |        |      |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------------------------------------|----------|------|-------|------|--------|------|--------|------|
| Month<br>Year                                                                                                                             | Jan.              | Feb. | Mar.                                      | Apr. | May     | June | July    | Aug.                               | Sept.    | Oct. | Nov.  | Dec. | Year   |      |        |      |
| 1958 P                                                                                                                                    | 2.43              | 1.27 | 3.48                                      | 6.65 | 4.89    | 3.89 | 5.54    | 2.60                               | 8.12     | 0.96 | 3.40  | 1.65 | 44.88  |      |        |      |
| Q                                                                                                                                         |                   |      |                                           |      |         |      | 1.30    | 0.45                               | 1.96     | 0.01 | 0.46  | 0.03 | 4.21   |      |        |      |
| 1959 P                                                                                                                                    | 3.79              | 3.87 | 3.07                                      | 3.46 | 6.05    | 5.92 | 3.13    | 4.94                               | 2.08     | 2.51 | 3.13  | 6.54 | 48.49  |      |        |      |
| Q                                                                                                                                         | 0.97              | 0.57 | 0.46                                      | 0.23 | 2.68    | 2.33 | 0.03    | 0.60                               | 0.26     | 0.20 | 0.55  | 2.30 | 11.18  |      |        |      |
| Normal P                                                                                                                                  | 6.30              | 4.90 | 6.28                                      | 4.82 | 4.26    | 4.15 | 4.17    | 3.13                               | 3.48     | 3.19 | 4.78  | 5.25 | 54.71  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                   |                   |      |                                           |      |         |      |         | Oxford, Mississippi Watershed WC-2 |          |      |       |      |        |      |        |      |
| YEAR                                                                                                                                      | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                    |          |      |       |      |        |      |        |      |
|                                                                                                                                           |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                    | 12 hours |      | 1 day |      | 2 days |      | 8 days |      |
|                                                                                                                                           | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                               | Date     | Vol. | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1958                                                                                                                                      | 9-19              | 0.76 | 9-19                                      | 0.41 | 9-19    | 0.48 | 9-19    | 0.97                               | 9-19     | 1.22 | 9-19  | 1.70 | 9-19   | 1.84 | 9-16   | 1.90 |
| 1959                                                                                                                                      | 6-11              | 4.02 | 6-11                                      | 0.92 | 6-11    | 1.04 | 5-26    | 1.19                               | 5-26     | 1.74 | 5-26  | 1.74 | 6-10   | 2.29 | 5-22   | 2.67 |
| Notes: Quality of records: Q-good, P-good. Normal P based on 33-yr. record (1920 - 1952) at USWB station, Holly Springs 2 N, Mississippi. |                   |      |                                           |      |         |      |         |                                    |          |      |       |      |        |      |        |      |
| 1/ Runoff measurements initiated July 1, 1958                                                                                             |                   |      |                                           |      |         |      |         |                                    |          |      |       |      |        |      |        |      |

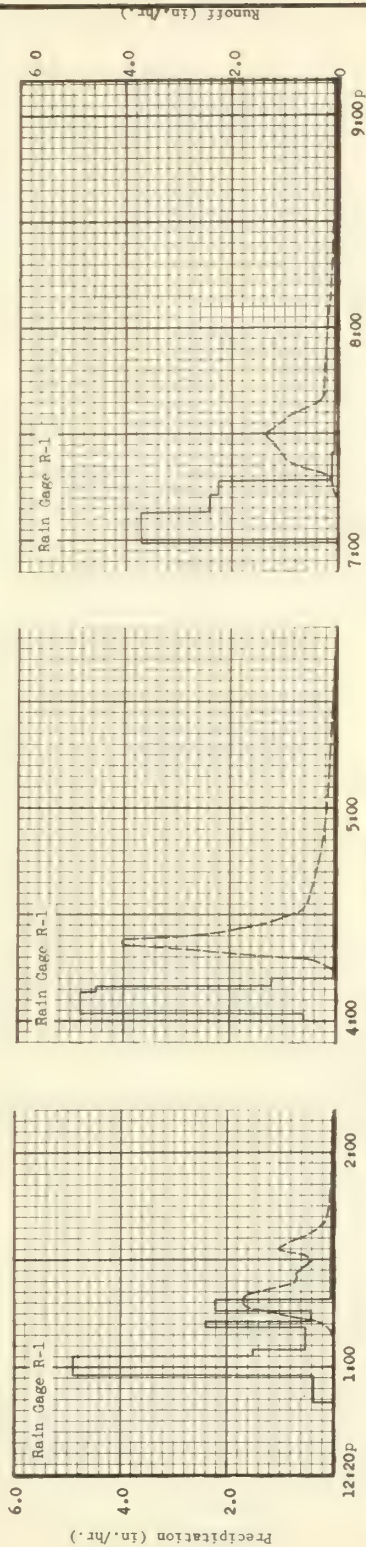
Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.



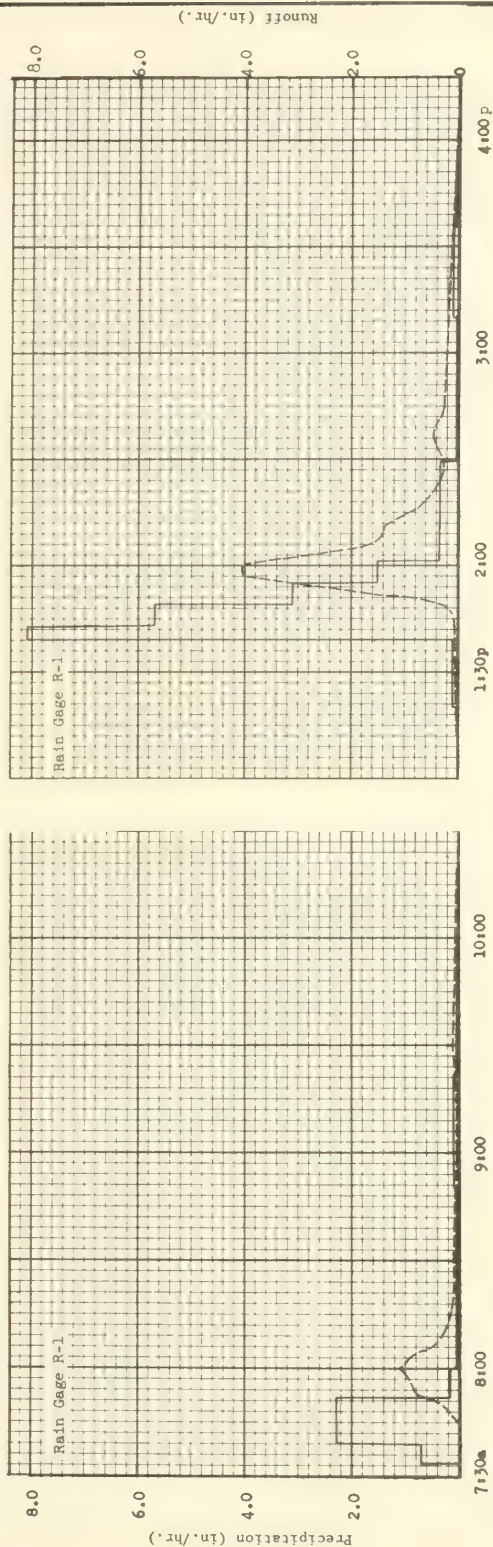
| SELECTED RUNOFF EVENTS |                      |                    |                        |                      |                  | Oxford, Mississippi Watershed WC-2<br>Area - 1.45 acres |                 |                  |
|------------------------|----------------------|--------------------|------------------------|----------------------|------------------|---------------------------------------------------------|-----------------|------------------|
| Antecedent conditions  |                      |                    | Rainfall               |                      |                  | Runoff                                                  |                 |                  |
| Date                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time       | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                                        | Rate<br>(in/hr) | Acc.<br>(inches) |
| Rain Gage R-1          |                      |                    | Event of May 26, 1959  |                      |                  |                                                         |                 |                  |
| 5-10-59                | .24                  | 0                  | 5-26-59                | Raingage R-1         |                  | 5-26-59                                                 |                 |                  |
| 5-11                   | .29                  | 0                  | 12:50p                 | 0                    | 0                | 1:08p                                                   | 0               | 0                |
| 5-12,13                | .05                  | 0                  | :58                    | 0.38                 | 0.05             | :14                                                     | .848            | 0.02             |
| 5-22                   | 1.83                 | .63                | 1:03                   | 4.92                 | .46              | :17                                                     | 1.696           | .08              |
| 5-25                   | .63                  | .30                | :05                    | 1.50                 | .51              | :20                                                     | 1.696           | .17              |
|                        |                      |                    | :11                    | .50                  | .56              | :24                                                     | .677            | .24              |
|                        |                      |                    | :13                    | 2.40                 | .64              | :26                                                     | .718            | .26              |
|                        |                      |                    | :16                    | .40                  | .66              | :30                                                     | .451            | .30              |
|                        |                      |                    | :19                    | 2.20                 | .77              | :33                                                     | 1.026           | .34              |
|                        |                      |                    | 2:10                   | .01                  | .78              | :38                                                     | .349            | .41              |
|                        |                      |                    | 4:00                   | 0                    | .78              | :42                                                     | .157            | .43              |
|                        |                      |                    | :02                    | .60                  | .80              | 2:01                                                    | .007            | .44              |
|                        |                      |                    | :08                    | 4.80                 | 1.28             | :30                                                     | 0               | .44              |
|                        |                      |                    | :10                    | 4.50                 | 1.43             | 4:14                                                    | 0               | .44              |
|                        |                      |                    | :12                    | 1.20                 | 1.47             | :18                                                     | 1.074           | .46              |
|                        |                      |                    | 5:40                   | .02                  | 1.49             | :20                                                     | 2.476           | .52              |
|                        |                      |                    | 6:59                   | 0                    | 1.49             | :22                                                     | 4.022           | .63              |
|                        |                      |                    | 7:08                   | 3.73                 | 2.05             | :23                                                     | 4.022           | .70              |
|                        |                      |                    | :13                    | 2.40                 | 2.25             | :26                                                     | 1.867           | .84              |
|                        |                      |                    | :17                    | 2.25                 | 2.40             | :36                                                     | .527            | .98              |
|                        |                      |                    | :25                    | .08                  | 2.41             | 5:06                                                    | .157            | 1.13             |
|                        |                      |                    | 9:15                   | .03                  | 2.47             | 6:18                                                    | .007            | 1.19             |
|                        |                      |                    |                        |                      |                  | :40                                                     | 0               | 1.19             |
|                        |                      |                    |                        |                      |                  | 7:12                                                    | 0               | 1.19             |
|                        |                      |                    |                        |                      |                  | :20                                                     | .602            | 1.21             |
|                        |                      |                    |                        |                      |                  | :24                                                     | 1.026           | 1.28             |
|                        |                      |                    |                        |                      |                  | :29                                                     | 1.375           | 1.38             |
|                        |                      |                    |                        |                      |                  | :31                                                     | 1.375           | 1.42             |
|                        |                      |                    |                        |                      |                  | :34                                                     | 1.026           | 1.48             |
|                        |                      |                    |                        |                      |                  | :40                                                     | .321            | 1.55             |
|                        |                      |                    |                        |                      |                  | 8:08                                                    | .157            | 1.66             |
|                        |                      |                    |                        |                      |                  | :44                                                     | .055            | 1.71             |
|                        |                      |                    |                        |                      |                  | 9:24                                                    | .007            | 1.74             |
|                        |                      |                    |                        |                      |                  | 10:00                                                   | 0               | 1.74             |
| Rain Gage R-1          |                      |                    | Event of June 11, 1959 |                      |                  |                                                         |                 |                  |
| 5-11-59                | 0.29                 | 0                  | 6-11-59                | Raingage R-1         |                  | 6-11-59                                                 |                 |                  |
| 5-12,13                | .05                  | 0                  | 7:34a                  | 0                    | 0                | 7:44a                                                   | 0               | 0                |
| 5-22                   | 1.83                 | 0.63               | :39                    | 0.72                 | 0.06             | :51                                                     | .486            | 0.02             |
| 5-25                   | .63                  | .30                | :52                    | 2.31                 | .56              | :59                                                     | 1.026           | .13              |
| 5-26                   | 2.47                 | 1.74               | 8:00                   | .15                  | .58              | 8:00                                                    | 1.122           | .15              |
| 5-30                   | .54                  | .01                | :50                    | .01                  | .59              | :01                                                     | 1.026           | .17              |
| 6-7                    | .09                  | 0                  | 9:22                   | .09                  | .64              | :06                                                     | .486            | .24              |
| 6-8                    | .50                  | 0                  | 10:00                  | .02                  | .65              | :47                                                     | .068            | .34              |
| 6-9                    | 1.01                 | .04                | 1:20p                  | 0                    | .65              | 9:28                                                    | .109            | .39              |
| 6-10                   | 1.49                 | .72                | :39                    | .09                  | .68              | 12:12p                                                  | 0               | .48              |
|                        |                      |                    | :43                    | 8.10                 | 1.22             | 1:12                                                    | 0               | .48              |
|                        |                      |                    | :49                    | 5.70                 | 1.79             | :48                                                     | .157            | .49              |
|                        |                      |                    | :55                    | 3.10                 | 2.10             | :51                                                     | .889            | .52              |
|                        |                      |                    | 2:01                   | 1.50                 | 2.25             | :54                                                     | 2.544           | .62              |
|                        |                      |                    | :29                    | .36                  | 2.42             | :57                                                     | 4.022           | .78              |
|                        |                      |                    | 3:10                   | .01                  | 2.43             | 2:01                                                    | 4.022           | .81              |
|                        |                      |                    | :35                    | .10                  | 2.47             | :03                                                     | 2.743           | .91              |
|                        |                      |                    | :50                    | .08                  | 2.49             | :05                                                     | 1.867           | .99              |
|                        |                      |                    |                        |                      |                  | :16                                                     | .759            | 1.19             |
|                        |                      |                    |                        |                      |                  | :25                                                     | .321            | 1.27             |
|                        |                      |                    |                        |                      |                  | :31                                                     | .321            | 1.30             |
|                        |                      |                    |                        |                      |                  | :36                                                     | .451            | 1.34             |
|                        |                      |                    |                        |                      |                  | 3:00                                                    | .205            | 1.44             |
|                        |                      |                    |                        |                      |                  | :20                                                     | .157            | 1.50             |
|                        |                      |                    |                        |                      |                  | :28                                                     | .021            | 1.52             |
|                        |                      |                    |                        |                      |                  | :44                                                     | .057            | 1.53             |
|                        |                      |                    |                        |                      |                  | 4:00                                                    | .034            | 1.54             |
|                        |                      |                    |                        |                      |                  | 6:00                                                    | 0               | 1.57             |
| Rain Gage R-1          |                      |                    | Event of June 11, 1959 |                      |                  |                                                         |                 |                  |
| 5-11-59                | 0.29                 | 0                  | 6-11-59                | Raingage R-1         |                  | 6-11-59                                                 |                 |                  |
| 5-12,13                | .05                  | 0                  | 7:34a                  | 0                    | 0                | 7:44a                                                   | 0               | 0                |
| 5-22                   | 1.83                 | 0.63               | :39                    | 0.72                 | 0.06             | :51                                                     | .486            | 0.02             |
| 5-25                   | .63                  | .30                | :52                    | 2.31                 | .56              | :59                                                     | 1.026           | .13              |
| 5-26                   | 2.47                 | 1.74               | 8:00                   | .15                  | .58              | 8:00                                                    | 1.122           | .15              |
| 5-30                   | .54                  | .01                | :50                    | .01                  | .59              | :01                                                     | 1.026           | .17              |
| 6-7                    | .09                  | 0                  | 9:22                   | .09                  | .64              | :06                                                     | .486            | .24              |
| 6-8                    | .50                  | 0                  | 10:00                  | .02                  | .65              | :47                                                     | .068            | .34              |
| 6-9                    | 1.01                 | .04                | 1:20p                  | 0                    | .65              | 9:28                                                    | .109            | .39              |
| 6-10                   | 1.49                 | .72                | :39                    | .09                  | .68              | 12:12p                                                  | 0               | .48              |
|                        |                      |                    | :43                    | 8.10                 | 1.22             | 1:12                                                    | 0               | .48              |
|                        |                      |                    | :49                    | 5.70                 | 1.79             | :48                                                     | .157            | .49              |
|                        |                      |                    | :55                    | 3.10                 | 2.10             | :51                                                     | .889            | .52              |
|                        |                      |                    | 2:01                   | 1.50                 | 2.25             | :54                                                     | 2.544           | .62              |
|                        |                      |                    | :29                    | .36                  | 2.42             | :57                                                     | 4.022           | .78              |
|                        |                      |                    | 3:10                   | .01                  | 2.43             | 2:01                                                    | 4.022           | .81              |
|                        |                      |                    | :35                    | .10                  | 2.47             | :03                                                     | 2.743           | .91              |
|                        |                      |                    | :50                    | .08                  | 2.49             | :05                                                     | 1.867           | .99              |
|                        |                      |                    |                        |                      |                  | :16                                                     | .759            | 1.19             |
|                        |                      |                    |                        |                      |                  | :25                                                     | .321            | 1.27             |
|                        |                      |                    |                        |                      |                  | :31                                                     | .321            | 1.30             |
|                        |                      |                    |                        |                      |                  | :36                                                     | .451            | 1.34             |
|                        |                      |                    |                        |                      |                  | 3:00                                                    | .205            | 1.44             |
|                        |                      |                    |                        |                      |                  | :20                                                     | .157            | 1.50             |
|                        |                      |                    |                        |                      |                  | :28                                                     | .021            | 1.52             |
|                        |                      |                    |                        |                      |                  | :44                                                     | .057            | 1.53             |
|                        |                      |                    |                        |                      |                  | 4:00                                                    | .034            | 1.54             |
|                        |                      |                    |                        |                      |                  | 6:00                                                    | 0               | 1.57             |
| Rain Gage R-1          |                      |                    | Event of June 11, 1959 |                      |                  |                                                         |                 |                  |
| 5-11-59                | 0.29                 | 0                  | 6-11-59                | Raingage R-1         |                  | 6-11-59                                                 |                 |                  |
| 5-12,13                | .05                  | 0                  | 7:34a                  | 0                    | 0                | 7:44a                                                   | 0               | 0                |
| 5-22                   | 1.83                 | 0.63               | :39                    | 0.72                 | 0.06             | :51                                                     | .486            | 0.02             |
| 5-25                   | .63                  | .30                | :52                    | 2.31                 | .56              | :59                                                     | 1.026           | .13              |
| 5-26                   | 2.47                 | 1.74               | 8:00                   | .15                  | .58              | 8:00                                                    | 1.122           | .15              |
| 5-30                   | .54                  | .01                | :50                    | .01                  | .59              | :01                                                     | 1.026           | .17              |
| 6-7                    | .09                  | 0                  | 9:22                   | .09                  | .64              | :06                                                     | .486            | .24              |
| 6-8                    | .50                  | 0                  | 10:00                  | .02                  | .65              | :47                                                     | .068            | .34              |
| 6-9                    | 1.01                 | .04                | 1:20p                  | 0                    | .65              | 9:28                                                    | .109            | .39              |
| 6-10                   | 1.49                 | .72                | :39                    | .09                  | .68              | 12:12p                                                  | 0               | .48              |
|                        |                      |                    | :43                    | 8.10                 | 1.22             | 1:12                                                    | 0               | .48              |
|                        |                      |                    | :49                    | 5.70                 | 1.79             | :48                                                     | .157            | .49              |
|                        |                      |                    | :55                    | 3.10                 | 2.10             | :51                                                     | .889            | .52              |
|                        |                      |                    | 2:01                   | 1.50                 | 2.25             | :54                                                     | 2.544           | .62              |
|                        |                      |                    | :29                    | .36                  | 2.42             | :57                                                     | 4.022           | .78              |
|                        |                      |                    | 3:10                   | .01                  | 2.43             | 2:01                                                    | 4.022           | .81              |
|                        |                      |                    | :35                    | .10                  | 2.47             | :03                                                     | 2.743           | .91              |
|                        |                      |                    | :50                    | .08                  | 2.49             | :05                                                     | 1.867           | .99              |
|                        |                      |                    |                        |                      |                  | :16                                                     | .759            | 1.19             |
|                        |                      |                    |                        |                      |                  | :25                                                     | .321            | 1.27             |
|                        |                      |                    |                        |                      |                  | :31                                                     | .321            | 1.30             |
|                        |                      |                    |                        |                      |                  | :36                                                     | .451            | 1.34             |
|                        |                      |                    |                        |                      |                  | 3:00                                                    | .205            | 1.44             |
|                        |                      |                    |                        |                      |                  | :20                                                     | .157            | 1.50             |
|                        |                      |                    |                        |                      |                  | :28                                                     | .021            | 1.52             |
|                        |                      |                    |                        |                      |                  | :44                                                     | .057            | 1.53             |
|                        |                      |                    |                        |                      |                  | 4:00                                                    | .034            | 1.54             |
|                        |                      |                    |                        |                      |                  | 6:00                                                    | 0               | 1.57             |

Notes: To convert runoff in in./hr. to cfs, multiply by 1.462.

For watershed map, see page 62.16-4.



May 26, 1959



June 11, 1959

OXFORD, MISSISSIPPI WATERSHED WC-2

OXFORD, MISSISSIPPI Watershed WC-3

LOCATION: North Mississippi Branch Experiment Station, Holly Springs, Miss.

AREA: 1.61 ac.

SHAPE: Roughly rectangular, width - 200 ft., length - 350 ft.

SLOPES: 19% is in 2-5% class; 81% in 5-8%. Aspect E.

SOILS: Loessial and Coastal Plains: Topsoil - silt loam in texture, 0 to 8 ins. in depth, weak to moderate fine granular structure. Subsoil - slow to moderately permeable, impeding layer at 15 to 20 ins. Internal drainage - medium to slow. Providence silt loam to silty clay loam - 100%.

EROSION: 1-10%; 2-75%; 3-15%.

LAND CAPABILITY: II-20%; III-50%; IV-30%.

SURFACE DRAINAGE: Good; Small earth dam at measuring station to funnel all surface runoff into flume. Length of principal waterway - 350 ft.

CHARACTER OF FLOW: Ephemeral - continuous.

INSTRUMENTATION: Runoff - two ft. Parshall flume and water stage recorder; Precipitation - recording gage.

WATERSHED CONDITIONS: Cultivated in corn continuously since 1957. Poor management - row slope from approximate contour to up and down hill, no terraces, 4000 to 6000 plants per acre, low fertilization. Winter cover consists of shredded corn stalks, dead grass, and weeds.

GENERALLY REPRESENTS: Cultivated areas with moderate to steep slopes in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                |                   |      |                                           |      |         |      |          | Oxford, Mississippi Watershed WC-3 |          |      |       |      |        |      |        |      |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|----------|------------------------------------|----------|------|-------|------|--------|------|--------|------|
| Month<br>Year                                                                                                                            | Jan.              | Feb. | Mar.                                      | Apr. | May     | June | July     | Aug.                               | Sept.    | Oct. | Nov.  | Dec. | Year   |      |        |      |
| 1958 P                                                                                                                                   | 2.43              | 1.27 | 3.48                                      | 6.65 | 4.89    | 3.89 | 5.54     | 2.60                               | 8.12     | 0.96 | 3.40  | 1.65 | 44.88  |      |        |      |
| Q                                                                                                                                        |                   |      |                                           |      |         |      | 1.08 1/2 | 0.60                               | 1.81     | T    | 0.57  | 0.04 | 4.10   |      |        |      |
| 1959 P                                                                                                                                   | 3.79              | 3.87 | 3.07                                      | 3.46 | 6.05    | 5.92 | 3.13     | 4.94                               | 2.08     | 2.51 | 3.13  | 6.54 | 48.49  |      |        |      |
| Q                                                                                                                                        | 0.92              | 0.64 | 0.53                                      | 0.24 | 2.78    | 2.57 | 0.20     | 1.17                               | 0.48     | 0.40 | 0.58  | 2.47 | 12.98  |      |        |      |
| Normal P                                                                                                                                 | 6.30              | 4.90 | 6.28                                      | 4.82 | 4.26    | 4.15 | 4.17     | 3.13                               | 3.48     | 3.19 | 4.78  | 5.25 | 54.71  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                  |                   |      |                                           |      |         |      |          | Oxford, Mississippi Watershed WC-3 |          |      |       |      |        |      |        |      |
| YEAR                                                                                                                                     | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |          |                                    |          |      |       |      |        |      |        |      |
|                                                                                                                                          |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours  |                                    | 12 hours |      | 1 day |      | 2 days |      | 8 days |      |
|                                                                                                                                          | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date     | Vol.                               | Date     | Vol. | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1958                                                                                                                                     | 9-19              | 0.84 | 9-19                                      | 0.45 | 9-19    | 0.47 | 9-19     | 0.94                               | 9-19     | 1.14 | 9-19  | 1.61 | 9-19   | 1.70 | 9-16   | 1.79 |
| 1959                                                                                                                                     | 6-11              | 5.08 | 6-11                                      | 1.45 | 6-11    | 1.49 | 6-11     | 1.53                               | 5-26     | 1.95 | 5-26  | 1.95 | 6-10   | 2.53 | 5-22   | 2.77 |
| Notes: Quality of records: Q-good, P-good. Normal P based on 33-yr. record (1920 - 1952) at USWB station Holly Springs 2 N, Mississippi. |                   |      |                                           |      |         |      |          |                                    |          |      |       |      |        |      |        |      |
| 1/ Runoff measurements initiated July 1, 1958                                                                                            |                   |      |                                           |      |         |      |          |                                    |          |      |       |      |        |      |        |      |

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

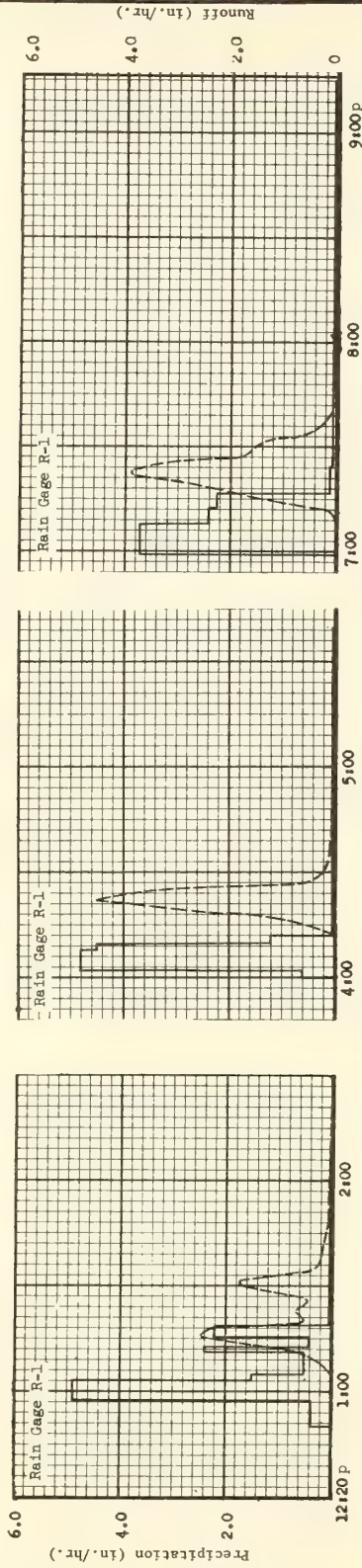


| SELECTED RUNOFF EVENTS                                                                                                                                                                                          |                      |                    |                        |                      |                  | Oxford, Mississippi Watershed WC-3<br>Area - 1.61 acres |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------------|----------------------|------------------|---------------------------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                           |                      |                    | Rainfall               |                      |                  | Runoff                                                  |                 |                  |
| Date                                                                                                                                                                                                            | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time       | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                                        | Rate<br>(in/hr) | Acc.<br>(inches) |
| Rain Gage R-1                                                                                                                                                                                                   |                      |                    | Event of May 26, 1959  |                      |                  |                                                         |                 |                  |
| 5-10-59                                                                                                                                                                                                         | .24                  | 0                  | 5-26-59                | Raingage R-1         |                  | 5-26-59                                                 |                 |                  |
| 5-11                                                                                                                                                                                                            | .29                  | 0                  | 12:50p                 | 0                    | 0                | 1:05p                                                   | 0               | 0                |
| 5-12,13                                                                                                                                                                                                         | .05                  | 0                  | :58                    | 0.38                 | 0.05             | :10                                                     | .407            | .01              |
| 5-22                                                                                                                                                                                                            | 1.83                 | .58                | 1:03                   | 4.92                 | .46              | :14                                                     | 1.897           | .08              |
| 5-25                                                                                                                                                                                                            | .63                  | .24                | :05                    | 1.50                 | .51              | :16                                                     | 2.470           | .15              |
|                                                                                                                                                                                                                 |                      |                    | :11                    | .50                  | .56              | :18                                                     | 2.230           | .23              |
|                                                                                                                                                                                                                 |                      |                    | :13                    | 2.40                 | .64              | :23                                                     | .684            | .31              |
|                                                                                                                                                                                                                 |                      |                    | :16                    | .40                  | .66              | :26                                                     | .474            | .34              |
|                                                                                                                                                                                                                 |                      |                    | :19                    | 2.20                 | .77              | :31                                                     | 1.786           | .43              |
|                                                                                                                                                                                                                 |                      |                    | 2:10                   | .01                  | .78              | :34                                                     | .542            | .49              |
|                                                                                                                                                                                                                 |                      |                    | 4:00                   | 0                    | .78              | :38                                                     | .209            | .52              |
|                                                                                                                                                                                                                 |                      |                    | :02                    | .60                  | .80              | :48                                                     | .062            | .54              |
|                                                                                                                                                                                                                 |                      |                    | :08                    | 4.80                 | 1.28             | 2:00                                                    | .012            | .54              |
|                                                                                                                                                                                                                 |                      |                    | :10                    | 4.50                 | 1.43             | :20                                                     | 0               | .54              |
|                                                                                                                                                                                                                 |                      |                    | :12                    | 1.20                 | 1.47             | 4:12                                                    | 0               | .54              |
|                                                                                                                                                                                                                 |                      |                    | 5:40                   | .02                  | 1.49             | :14                                                     | .290            | .55              |
|                                                                                                                                                                                                                 |                      |                    | 6:59                   | 0                    | 1.49             | :20                                                     | 3.222           | .71              |
|                                                                                                                                                                                                                 |                      |                    | 7:08                   | 3.73                 | 2.05             | :22                                                     | 4.552           | .83              |
|                                                                                                                                                                                                                 |                      |                    | :13                    | 2.40                 | 2.25             | :25                                                     | 3.487           | 1.03             |
|                                                                                                                                                                                                                 |                      |                    | :17                    | 2.25                 | 2.40             | :26                                                     | 1.189           | 1.07             |
|                                                                                                                                                                                                                 |                      |                    | :25                    | .08                  | 2.41             | :32                                                     | .142            | 1.12             |
|                                                                                                                                                                                                                 |                      |                    | 9:15                   | .03                  | 2.47             | :40                                                     | .062            | 1.13             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | 5:10                                                    | .012            | 1.14             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | 6:20                                                    | 0               | 1.14             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | 7:09                                                    | 0               | 1.14             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :12                                                     | .142            | 1.14             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :16                                                     | 1.682           | 1.21             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :20                                                     | 2.963           | 1.36             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :22                                                     | 3.899           | 1.48             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :23                                                     | 3.899           | 1.54             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :27                                                     | 1.786           | 1.74             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :32                                                     | 1.189           | 1.87             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :38                                                     | .185            | 1.92             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :48                                                     | .049            | 1.94             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | 10:00                                                   | 0               | 1.95             |
| Watershed Conditions: 100% of area was in corn, 6 to 10 inches high. About 8000 plants per acre with sparse weeds and grasses. No tillage operation since planting on April 29. Planted on approximate contour. |                      |                    |                        |                      |                  |                                                         |                 |                  |
| Rain Gage R-1                                                                                                                                                                                                   |                      |                    | Event of June 11, 1959 |                      |                  |                                                         |                 |                  |
| 5-11-59                                                                                                                                                                                                         | 0.29                 | 0                  | 6-11-59                | Raingage R-1         |                  | 6-11-59                                                 |                 |                  |
| 5-12,13                                                                                                                                                                                                         | .05                  | 0                  | 7:34a                  | 0                    | 0                | 7:48a                                                   | 0               | 0                |
| 5-22                                                                                                                                                                                                            | 1.83                 | 0.58               | :39                    | 0.72                 | 0.06             | :53                                                     | .314            | 0.01             |
| 5-25                                                                                                                                                                                                            | .63                  | .24                | :52                    | 2.31                 | .56              | :59                                                     | 1.146           | .08              |
| 5-26                                                                                                                                                                                                            | 2.47                 | 1.95               | 8:00                   | .15                  | .58              | 8:02                                                    | 1.478           | .15              |
| 5-30                                                                                                                                                                                                            | .54                  | .01                | :50                    | .01                  | .59              | :04                                                     | 1.189           | .19              |
| 6-7                                                                                                                                                                                                             | .09                  | 0                  | 9:22                   | .09                  | .64              | :07                                                     | .437            | .22              |
| 6-8                                                                                                                                                                                                             | .50                  | 0                  | 10:00                  | .02                  | .65              | :30                                                     | .062            | .27              |
| 6-9                                                                                                                                                                                                             | 1.01                 | .04                | 1:20p                  | 0                    | .65              | 1:00p                                                   | 0               | .34              |
| 6-10                                                                                                                                                                                                            | 1.49                 | .67                | :39                    | .09                  | .68              | 1:29                                                    | 0               | .34              |
|                                                                                                                                                                                                                 |                      |                    | :43                    | 8.10                 | 1.22             | :51                                                     | .407            | .35              |
|                                                                                                                                                                                                                 |                      |                    | :49                    | 5.70                 | 1.79             | :54                                                     | 1.786           | .40              |
|                                                                                                                                                                                                                 |                      |                    | :55                    | 3.10                 | 2.10             | :58                                                     | 4.189           | .60              |
|                                                                                                                                                                                                                 |                      |                    | 2:01                   | 1.50                 | 2.25             | 2:01                                                    | 5.082           | .83              |
|                                                                                                                                                                                                                 |                      |                    | :29                    | .36                  | 2.42             | :02                                                     | 5.082           | .92              |
|                                                                                                                                                                                                                 |                      |                    | 3:10                   | .01                  | 2.43             | :05                                                     | 4.189           | 1.15             |
|                                                                                                                                                                                                                 |                      |                    | :35                    | .10                  | 2.47             | :09                                                     | 2.409           | 1.38             |
|                                                                                                                                                                                                                 |                      |                    | :50                    | .08                  | 2.49             | :13                                                     | 1.632           | 1.51             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :20                                                     | .764            | 1.65             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :31                                                     | .259            | 1.72             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :36                                                     | .505            | 1.75             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | 3:00                                                    | .062            | 1.79             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :35                                                     | .031            | 1.83             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :44                                                     | .062            | 1.83             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | :54                                                     | .062            | 1.83             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | 4:13                                                    | .031            | 1.85             |
|                                                                                                                                                                                                                 |                      |                    |                        |                      |                  | 6:00                                                    | 0               | 1.86             |
| Watershed Conditions: 100% of area was in corn, 10 to 15 inches high. About 8000 plants per acre with considerable weeds and grasses. Last tillage operation was on June 3. Cultivated on approximate contour.  |                      |                    |                        |                      |                  |                                                         |                 |                  |

Notes: To convert runoff in in./hr. to cfs, multiply by 1.623.

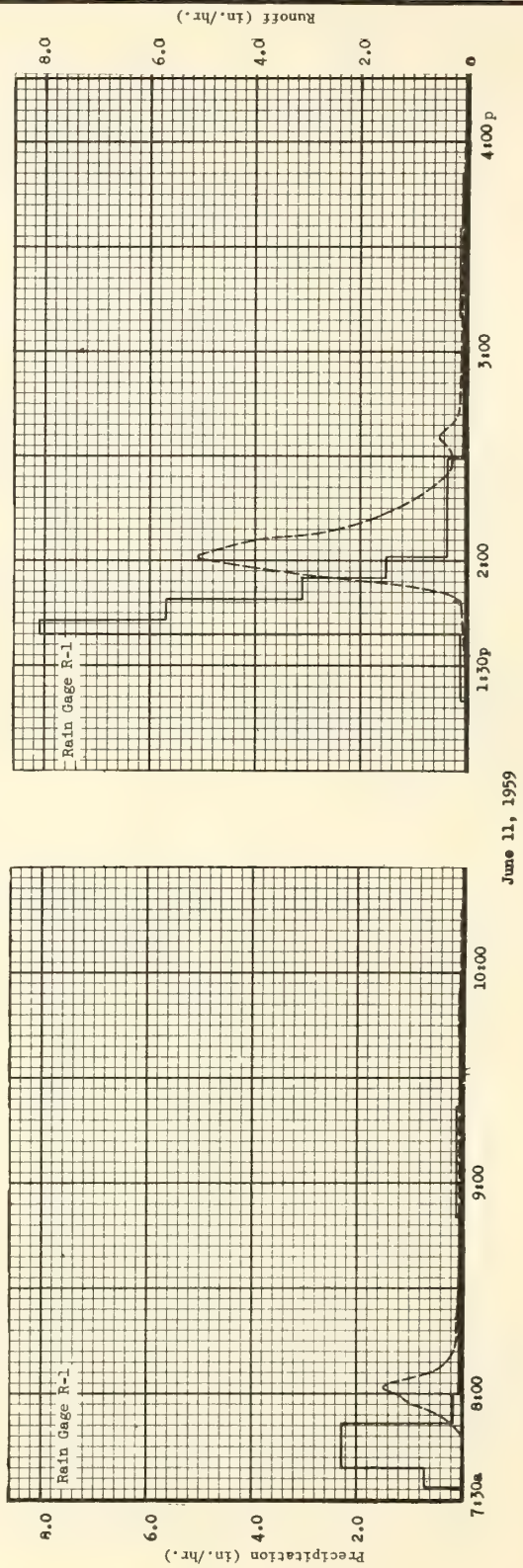
For map of watershed, see page 62.16-4.





May 26, 1959

OXFORD, MISSISSIPPI WATERSHED WC-3



June 11, 1959

OXFORD, MISSISSIPPI Watershed WP-4LOCATION: North Mississippi Branch Experiment Station, Holly Springs, Miss.AREA: 3.01 ac.SHAPE: Roughly rectangular, width - 250 ft., length - 525 ft.SLOPES: 4% is in 2-5% class; 29% in 5-8%; 54% in 8-12%; 13% in 12-17%. Aspect S.

SOILS: Loessial and Coastal Plains: Topsoil - 17% silt loam in texture, 0 to 10 ins. in depth, weak coarse granular structure; 45% silt loam in texture, 0 to 8 ins. in depth, weak fine granular structure; 38% fine sandy loam, 0 to 12 ins. in depth, weak fine crumb structure. Subsoil - 17% slow permeability, impeding layer at 15 to 20 ins.; 45% moderate to slow permeability, impeding layer at 15 to 20 ins.; 38% moderate to rapid permeability, no impeding layer. Internal drainage - medium to rapid. Grenada silt loam - 17%; Providence silt loam - 45%; Ruston fine sandy loam - 38%.

EROSION: 1-20%; 2-50%; 3-30%.LAND CAPABILITY: III-25%; IV-25%; V-35%; VI-15%.

SURFACE DRAINAGE: Good; Small earth dam at measuring station to funnel all surface runoff into flume. Length of principal waterway 440 ft.

CHARACTER OF FLOW: Ephemeral - continuous.INSTRUMENTATION: Runoff - two ft. Parshall flume and water stage recorder; Precipitation - recording gage.

WATERSHED CONDITIONS: Permanent Pasture (common lespedeza and native grasses) since 1956. Poor cover on the steeper slopes. Poor management - overgrazed, no fertilization.

GENERALLY REPRESENTS: Areas in permanent pasture with moderate to steep slopes in the transitional zone between the Southern Coastal Plain (P-133), and the Southern Mississippi Valley Silty Uplands (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

## Oxford, Mississippi Watershed WP-4

| Year     | Month | Jan. | Feb. | Mar. | Apr. | May  | June | July                | Aug. | Sept. | Oct. | Nov. | Dec. | Year  |
|----------|-------|------|------|------|------|------|------|---------------------|------|-------|------|------|------|-------|
| 1958     | P     | 2.43 | 1.27 | 3.48 | 6.65 | 4.89 | 3.89 | 5.54                | 2.60 | 8.12  | 0.96 | 3.40 | 1.65 | 44.88 |
|          | Q     |      |      |      |      |      |      | 0.93 <sup>1/2</sup> | 0.48 | 1.48  | T    | 0.51 | 0.06 | 3.46  |
| 1959     | P     | 3.79 | 3.87 | 3.07 | 3.46 | 6.05 | 5.92 | 3.13                | 4.94 | 2.08  | 2.51 | 3.13 | 6.54 | 48.49 |
|          | Q     | 0.98 | 0.98 | 0.78 | 0.56 | 2.44 | 3.02 | 0.19                | 0.92 | 0.47  | 0.44 | 0.52 | 2.04 | 13.34 |
| Normal P |       | 6.30 | 4.90 | 6.28 | 4.82 | 4.26 | 4.15 | 4.17                | 3.13 | 3.48  | 3.19 | 4.78 | 5.25 | 54.71 |

## ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

## Oxford, Mississippi Watershed WP-4

| YEAR | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |          |      |       |      |        |      |        |      |
|------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|----------|------|-------|------|--------|------|--------|------|
|      |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours |      | 1 day |      | 2 days |      | 8 days |      |
|      | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date     | Vol. | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1958 | 9-19              | 1.32 | 9-19                                      | 0.46 | 9-19    | 0.47 | 9-19    | 0.98 | 9-19     | 1.15 | 9-19  | 1.44 | 9-19   | 1.46 | 9-16   | 1.49 |
| 1959 | 6-11              | 4.65 | 6-11                                      | 1.42 | 6-11    | 1.48 | 6-11    | 1.51 | 6-11     | 1.80 | 6-11  | 2.00 | 6-10   | 2.70 | 6-8    | 3.02 |

Notes: Quality of records: Q-good, P-good. Normal P based on 33-yr. record (1920 - 1952) at USWB station, Holly Springs 2 W, Mississippi.

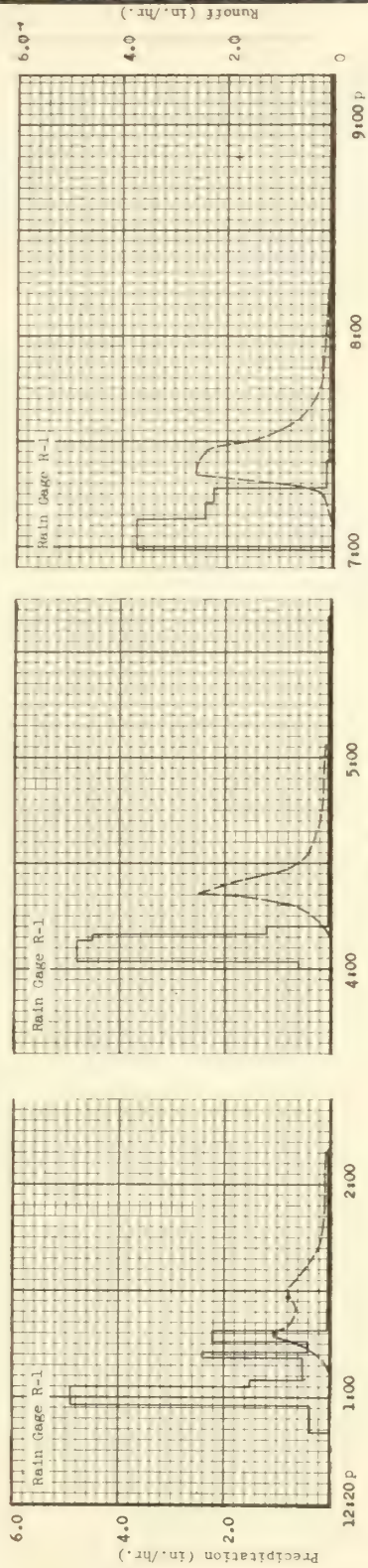
<sup>1/2</sup> Runoff measurements initiated July 1, 1958

Cooperative Research Project of USDA, University of Mississippi, and Mississippi State Agricultural Experiment Station.

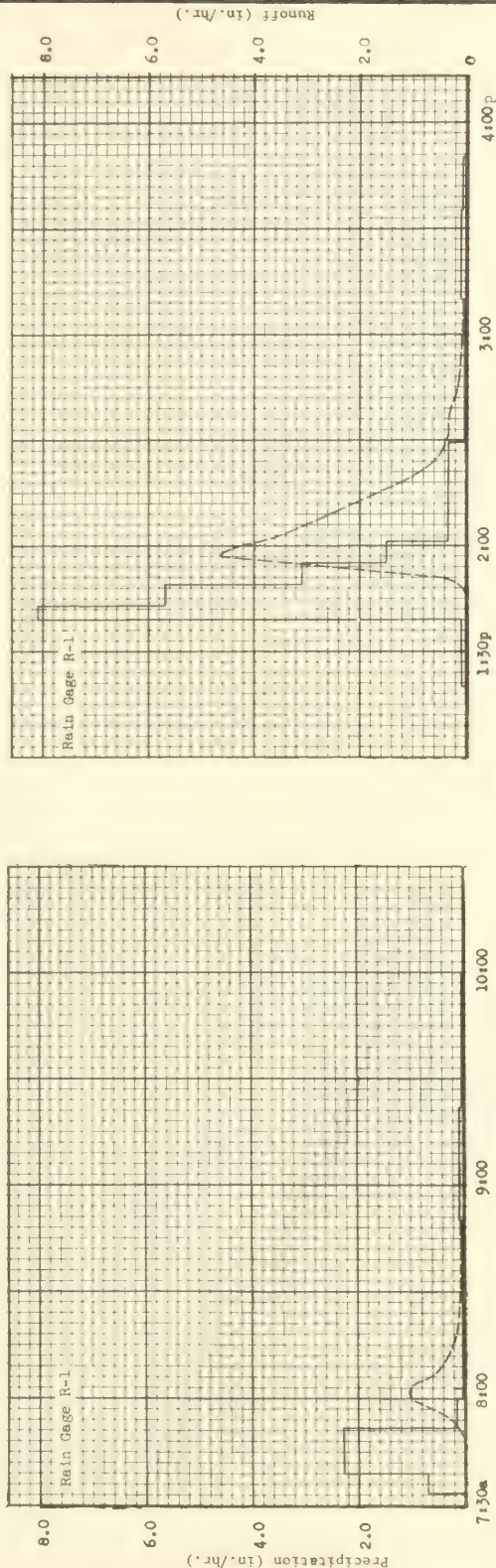
| SELECTED RUNOFF EVENTS                                                                                     |                      |                    |                        |                      |                  | Oxford, Mississippi Watershed WF-4<br>Area - 3.01 acres |                 |                  |
|------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------------|----------------------|------------------|---------------------------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                      |                      |                    | Rainfall               |                      |                  | Runoff                                                  |                 |                  |
| Date                                                                                                       | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time       | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                                        | Rate<br>(in/hr) | Acc.<br>(inches) |
| Main Gage R-1                                                                                              |                      |                    | Event of May 26, 1959  |                      |                  |                                                         |                 |                  |
| 5-10-59                                                                                                    | 0.24                 | 0                  | 5-26-59                | Raingage R-1         |                  | 5-26-59                                                 |                 |                  |
| 5-11                                                                                                       | .29                  | 0                  | 12:50p                 | 0                    | 0                | 1:08p                                                   | 0               | 0                |
| 5-12.13                                                                                                    | .05                  | 0                  | :58                    | 0.38                 | 0.05             | :14                                                     | .451            | 0.01             |
| 5-22                                                                                                       | 1.83                 | 0.73               | 1:03                   | 4.92                 | .46              | :17                                                     | 1.074           | .05              |
| 5-25                                                                                                       | .63                  | .16                | :05                    | 1.50                 | .51              | :19                                                     | 1.074           | .09              |
|                                                                                                            |                      |                    | :11                    | .50                  | .56              | :25                                                     | .613            | .17              |
|                                                                                                            |                      |                    | :13                    | 2.40                 | .64              | :29                                                     | .791            | .21              |
|                                                                                                            |                      |                    | :16                    | .40                  | .66              | :31                                                     | .791            | .23              |
|                                                                                                            |                      |                    | :19                    | 2.20                 | .77              | :36                                                     | .494            | .29              |
|                                                                                                            |                      |                    | 2:10                   | .01                  | .78              | :44                                                     | .155            | .33              |
|                                                                                                            |                      |                    | 4:00                   | 0                    | .78              | :52                                                     | .086            | .34              |
|                                                                                                            |                      |                    | :02                    | .60                  | .80              | 2:10                                                    | .026            | .35              |
|                                                                                                            |                      |                    | :08                    | 4.80                 | 1.28             | 4:00                                                    | 0               | .36              |
|                                                                                                            |                      |                    | :10                    | 4.50                 | 1.43             | 4:10                                                    | 0               | .36              |
|                                                                                                            |                      |                    | :12                    | 1.20                 | 1.47             | :18                                                     | .636            | .38              |
|                                                                                                            |                      |                    | 5:40                   | .02                  | 1.49             | :21                                                     | 1.865           | .44              |
|                                                                                                            |                      |                    | 6:59                   | 0                    | 1.49             | :22                                                     | 2.514           | .47              |
|                                                                                                            |                      |                    | 7:08                   | 3.73                 | 2.05             | :25                                                     | 1.865           | .58              |
|                                                                                                            |                      |                    | :13                    | 2.40                 | 2.25             | :28                                                     | .956            | .65              |
|                                                                                                            |                      |                    | :17                    | 2.25                 | 2.40             | :32                                                     | .451            | .69              |
|                                                                                                            |                      |                    | :25                    | .08                  | 2.41             | :36                                                     | .326            | .72              |
|                                                                                                            |                      |                    | 9:15                   | .03                  | 2.47             | :40                                                     | .217            | .73              |
|                                                                                                            |                      |                    |                        |                      |                  | 5:02                                                    | .043            | .77              |
|                                                                                                            |                      |                    |                        |                      |                  | 7:00                                                    | 0               | .79              |
|                                                                                                            |                      |                    |                        |                      |                  | :08                                                     | 0               | .79              |
| Watershed Conditions: 100% of area in permanent pasture (common lespedeza and native grasses). Good cover. |                      |                    |                        |                      |                  | :16                                                     | .217            | .79              |
|                                                                                                            |                      |                    |                        |                      |                  | :18                                                     | .900            | .81              |
|                                                                                                            |                      |                    |                        |                      |                  | :21                                                     | 2.596           | .89              |
|                                                                                                            |                      |                    |                        |                      |                  | :22                                                     | 2.596           | .94              |
|                                                                                                            |                      |                    |                        |                      |                  | :28                                                     | 2.395           | 1.18             |
|                                                                                                            |                      |                    |                        |                      |                  | :34                                                     | .985            | 1.36             |
|                                                                                                            |                      |                    |                        |                      |                  | :40                                                     | .409            | 1.42             |
|                                                                                                            |                      |                    |                        |                      |                  | :48                                                     | .185            | 1.46             |
|                                                                                                            |                      |                    |                        |                      |                  | 8:10                                                    | .053            | 1.50             |
|                                                                                                            |                      |                    |                        |                      |                  | :36                                                     | .016            | 1.52             |
|                                                                                                            |                      |                    |                        |                      |                  | 11:20                                                   | 0               | 1.53             |
| Rain Gage R-1                                                                                              |                      |                    | Event of June 11, 1959 |                      |                  |                                                         |                 |                  |
| 5-11-59                                                                                                    | 0.29                 | 0                  | 6-11-59                | Raingage R-1         |                  | 6-11-59                                                 |                 |                  |
| 5-12,13                                                                                                    | .05                  | 0                  | 7:34a                  | 0                    | 0                | 7:49a                                                   | 0               | 0                |
| 5-22                                                                                                       | 1.83                 | 0.73               | :39                    | .72                  | .06              | :54                                                     | .217            | 0.01             |
| 5-25                                                                                                       | .63                  | .16                | :52                    | 2.31                 | .56              | :59                                                     | .929            | .05              |
| 5-26                                                                                                       | 2.47                 | 1.53               | 8:00                   | .15                  | .58              | 8:01                                                    | 1.074           | .08              |
| 5-30                                                                                                       | .54                  | .02                | :50                    | .01                  | .59              | :03                                                     | 1.074           | .12              |
| 6-7                                                                                                        | .09                  | 0                  | 9:22                   | .09                  | .64              | :06                                                     | .712            | .17              |
| 6-8                                                                                                        | .50                  | .01                | 10:00                  | .02                  | .65              | :10                                                     | .389            | .20              |
| 6-9                                                                                                        | 1.01                 | .31                | 1:20p                  | 0                    | .65              | :33                                                     | .053            | .26              |
| 6-10                                                                                                       | 1.49                 | .90                | :39                    | .09                  | .68              | 12:04p                                                  | 0               | .29              |
|                                                                                                            |                      |                    | :43                    | 8.10                 | 1.22             | 1:47                                                    | 0               | .29              |
|                                                                                                            |                      |                    | :49                    | 5.70                 | 1.79             | :51                                                     | .409            | .30              |
|                                                                                                            |                      |                    | :55                    | 3.10                 | 2.10             | :55                                                     | 3.394           | .38              |
|                                                                                                            |                      |                    | 2:01                   | 1.50                 | 2.25             | :57                                                     | 4.646           | .52              |
|                                                                                                            |                      |                    | :29                    | .36                  | 2.42             | :58                                                     | 4.646           | .60              |
|                                                                                                            |                      |                    | 3:10                   | .01                  | 2.43             | 2:03                                                    | 3.460           | .94              |
|                                                                                                            |                      |                    | :35                    | .10                  | 2.47             | :07                                                     | 2.801           | 1.14             |
|                                                                                                            |                      |                    | :50                    | .08                  | 2.49             | :11                                                     | 2.241           | 1.31             |
|                                                                                                            |                      |                    |                        |                      |                  | :16                                                     | 1.483           | 1.47             |
|                                                                                                            |                      |                    |                        |                      |                  | :22                                                     | .738            | 1.57             |
| Watershed Conditions: 100% of area in permanent pasture (common lespedeza and native grasses). Good cover. |                      |                    |                        |                      |                  | :31                                                     | .346            | 1.65             |
|                                                                                                            |                      |                    |                        |                      |                  | :36                                                     | .346            | 1.68             |
|                                                                                                            |                      |                    |                        |                      |                  | :50                                                     | .112            | 1.73             |
|                                                                                                            |                      |                    |                        |                      |                  | 3:16                                                    | .026            | 1.75             |
|                                                                                                            |                      |                    |                        |                      |                  | 7:30                                                    | 0               | 1.80             |

Notes: To convert runoff in in./hr. to cfs, multiply by 3.035.





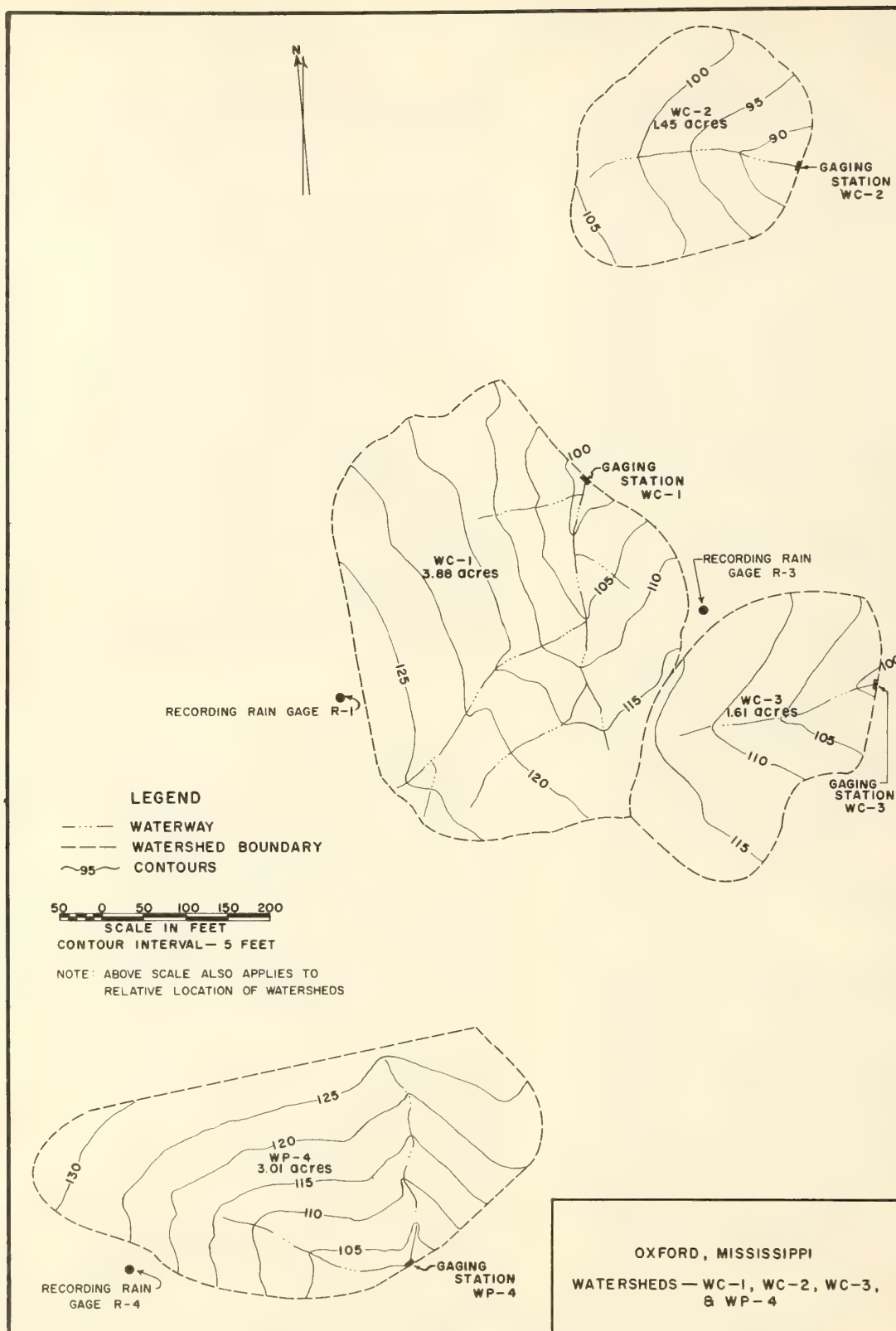
May 26, 1959



June 11, 1959

OXFORD, MISSISSIPPI WATERSHED WP-1





## TOMBSTONE, ARIZONA Watershed W-1

**LOCATION:** Cochise County; at Tombstone, Walnut Gulch, tributary of San Pedro River.

**AREA:** 57.7 sq. mi. (36,900 ac.) **SHAPE:** Butterfly, approximately 16 miles long by 6 miles wide.

**SLOPES:** Not available

Aspect W

**SOILS:** Tombstone, a gravelly loam, calcareous throughout, moderately permeable surface and subsoil--40%. Earp, residual on old fan material consolidated to a lime conglomerate, rhyolite the chief constituent; noncalcareous surface, moderately calcareous subsoil; moderately permeable--20%. Tortugas, from limestone; calcareous surface underlain by consolidated caliche--10%. Schieflin, from limestone conglomerate; calcareous surface underlain by consolidated caliche--7%. Remaining 23% made up of 10 other soils varying from slowly permeable to moderately permeable.

**EROSION:** 1 - 40%; 2 - 55%; 3 - 5%.

**LAND CAPABILITY:** V - 40%; VI - 60%.

**SURFACE DRAINAGE:** Good, length of principal drainage way, 21 miles.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff - cutoff wall in natural channel, recorder with 8 hr. chart; Precipitation - 66 recording gages, 24 hr. chart, 6 standard gages.

**WATERSHED CONDITIONS:** Includes watersheds 2, 3, 4, & 5. 65 percent of area supports desert shrubs (Whitethorn, creosotebush, tarbush) with 23% cover and 2% grass cover; 35% is grassland with approximately 20% grass cover (crown spread) and 5% shrub cover.

**GENERALLY REPRESENTS:** Desert grassland ranges in the Southeastern Arizona Basin and Range resource area (D-41).

| MONTHLY PRECIPITATION AND RUNOFF (Inches) |   |      |      |      |      |      | Tombstone, Arizona Watershed W-1 |      |      |       |      |      |      |       |
|-------------------------------------------|---|------|------|------|------|------|----------------------------------|------|------|-------|------|------|------|-------|
| Month                                     |   | Jan. | Feb. | Mar. | Apr. | May  | June                             | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year  |
| Year                                      |   |      |      |      |      |      |                                  |      |      |       |      |      |      |       |
| 1954                                      | P | 0.55 | 0.22 | 0.34 | 0    | 0.58 | 1.37                             | 2.11 | 4.86 | 0.61  | 0.87 | 0    | 0.02 | 11.53 |
|                                           | Q | NR   | NR   | NR   | NR   | 0    | 0                                | 0    | NR   | NR    | NR   | NR   | NR   | Inc.  |
| 1955                                      | P | 1.34 | .23  | .31  | 0    | .02  | .43                              | 8.43 | 3.66 | .21   | .17  | .05  | .22  | 15.07 |
|                                           | Q | NR   | NR   | NR   | NR   | NR   | NR                               | NR   | NR   | NR    | NR   | NR   | NR   | NR    |
| 1956                                      | P | .66  | .27  | 0    | .14  | .01  | .56                              | 4.18 | 1.10 | .01   | .23  | .06  | .14  | 7.36  |
|                                           | Q | NR   | NR   | NR   | NR   | NR   | NR                               | NR   | NR   | NR    | NR   | NR   | NR   | NR    |
| 1957                                      | P | 1.42 | .09  | 1.34 | .04  | .22  | .42                              | 2.40 | 4.57 | .02   | 1.29 | .07  | .28  | 12.16 |
|                                           | Q | NR   | NR   | NR   | NR   | NR   | NR                               | NR   | .53  | 0     | 0    | 0    | 0    | Inc.  |
| 1958                                      | P | 0    | 1.11 | 1.88 | .61  | .02  | .23                              | 1.32 | 4.91 | 1.92  | .94  | .39  | 0    | 13.33 |
|                                           | Q | 0    | 0    | 0    | 0    | 0    | .01                              | 0    | .35  | .01   | 0    | 0    | 0    | .37   |
| 1959                                      | P | 0    | .42  | 0    | .07  | 0    | .88                              | 4.38 | 3.71 | .58   | 1.24 | .84  | .88  | 13.00 |
|                                           | Q | 0    | 0    | 0    | 0    | 0    | 0                                | .24  | .03  | 0     | 0    | 0    | 0    | .27   |
| Normal                                    | P | .86  | .82  | .61  | .29  | .20  | .51                              | 3.68 | 3.50 | 1.53  | .64  | .63  | .87  | 14.14 |

| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS |                   |        |                                           |        |         |        |         | Tombstone, Arizona Watershed W-1 |          |        |       |        |        |        |        |        |
|-------------------------------------------------------------------------------------------------------------------------|-------------------|--------|-------------------------------------------|--------|---------|--------|---------|----------------------------------|----------|--------|-------|--------|--------|--------|--------|--------|
| YEAR                                                                                                                    | MAXIMUM DISCHARGE |        | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
|                                                                                                                         |                   |        | 1 hour                                    |        | 2 hours |        | 6 hours |                                  | 12 hours |        | 1 day |        | 2 days |        | 8 days |        |
|                                                                                                                         | Date              | Rate   | Date                                      | Vol.   | Date    | Vol.   | Date    | Vol.                             | Date     | Vol.   | Date  | Vol.   | Date   | Vol.   | Date   | Vol.   |
| 1954                                                                                                                    | Inc.              |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
| 1955                                                                                                                    | NR                |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
| 1956                                                                                                                    | NR                |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
| 1957                                                                                                                    | 8-17              | 0.5360 | 8-17                                      | 0.3186 | 8-17    | 0.3729 | 8-17    | 0.4039                           | 8-17     | 0.4039 | 8-17  | 0.4039 | 8-17   | 0.4039 | 8-17   | 0.4158 |
| 1958                                                                                                                    | 8-16              | .1635  | 8-16                                      | .0896  | 8-16    | .1335  | 8-16    | .1678                            | 8-16     | .1678  | 8-16  | .1678  | 8-16   | .1678  | 8-16   | .2780  |
| 1959                                                                                                                    | 7-26              | .1326  | 7-26                                      | .0853  | 7-26    | .1330  | 7-26    | .1730                            | 7-26     | .1752  | 7-26  | .1752  | 7-26   | .1753  | 7-26   | .2014  |

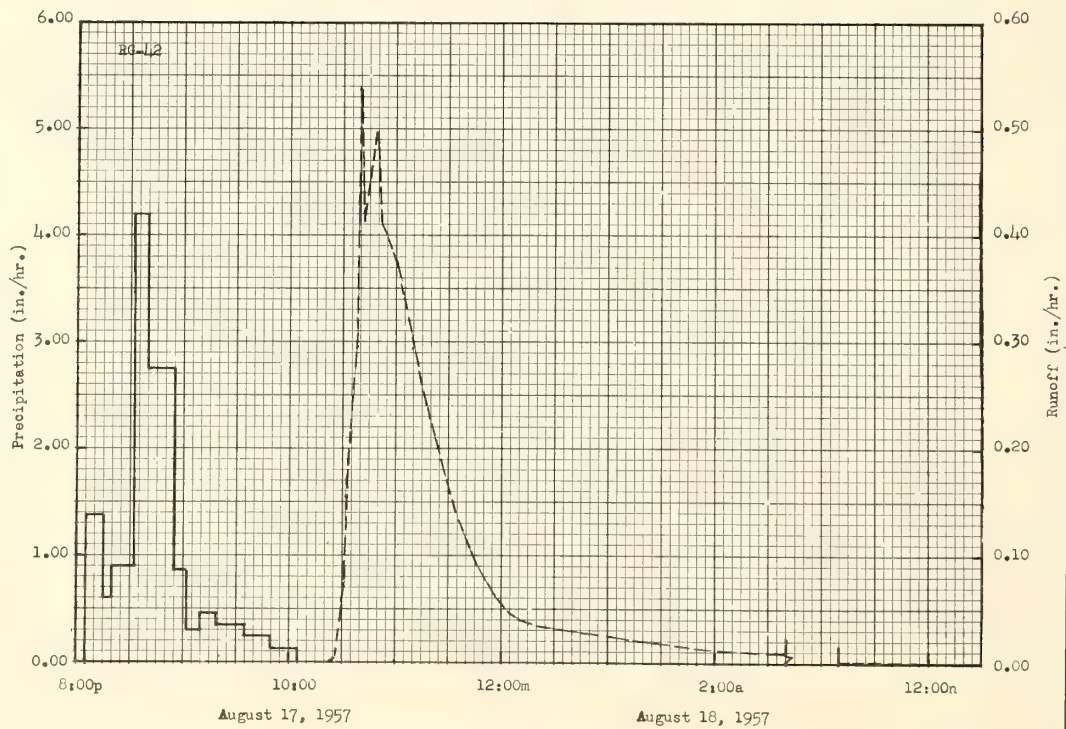
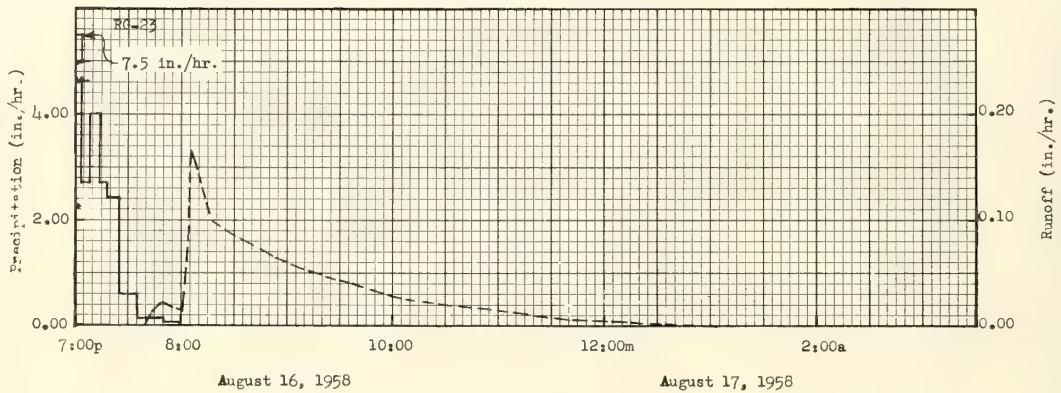
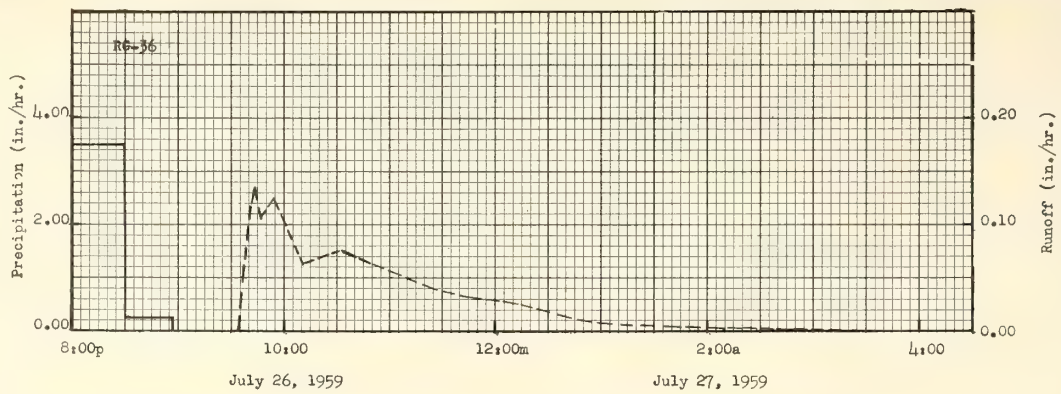
**Notes:** Quality of record: P, poor in 1954; fair in 1955; good, 1956 through 1959. Q, incomplete in 1954 and 1957; no record in 1955 and 1956; poor in 1958 and 1959. Monthly P is arithmetic average of gages.

Normal P based on 60 years record (1897-1957), USWB Station, Tombstone, Arizona.

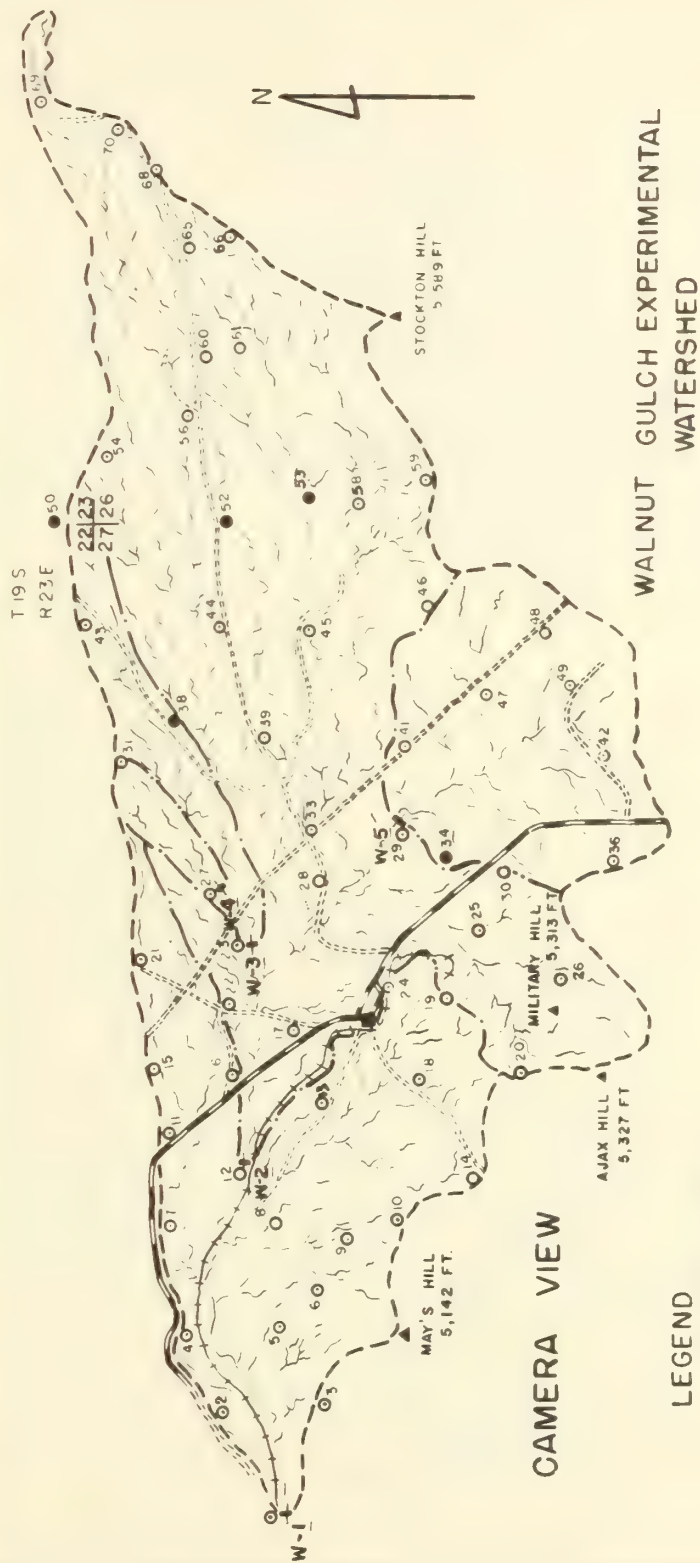
| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                      |                   |                 |               |                   |               | Tombstone, Arizona Watershed W-1 |              |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|---------------|-------------------|---------------|----------------------------------|--------------|---------------|
| Antecedent conditions                                                                                                                                                                                                                                       |                   |                 | Rainfall      |                   |               | Runoff                           |              |               |
| Date                                                                                                                                                                                                                                                        | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                    | Rate (in/hr) | Acc. (inches) |
| Event of August 17, 1957                                                                                                                                                                                                                                    |                   |                 |               |                   |               |                                  |              |               |
| Raingage 29                                                                                                                                                                                                                                                 |                   |                 |               |                   |               |                                  |              |               |
| 7-19-57                                                                                                                                                                                                                                                     | 0.42              | NR              | 8-17-57       | Raingage 29       |               | 8-17-57                          |              |               |
| 7-24                                                                                                                                                                                                                                                        | .13               | NR              | 8:48p         | 0                 | 0             | 10:23p                           | 0            | 0             |
| 7-25                                                                                                                                                                                                                                                        | .02               | NR              | 9:05          | 4.66              | 1.32          | :24                              | .0005        | 0             |
| 7-26                                                                                                                                                                                                                                                        | .23               | NR              | :22           | .46               | 1.45          | :26                              | .0021        | 0             |
| 7-29                                                                                                                                                                                                                                                        | 1.01              | NR              | :25           | 2.00              | 1.55          | :27                              | .0157        | .0002         |
| 7-31                                                                                                                                                                                                                                                        | .04               | NR              | :30           | .60               | 1.60          | :28                              | .0358        | .0005         |
| 8-2                                                                                                                                                                                                                                                         | 1.25              | NR              | :35           | 1.44              | 1.72          | :30                              | .0506        | .0019         |
| 8-5                                                                                                                                                                                                                                                         | 1.00              | NR              | :48           | .18               | 1.76          | :32                              | .0753        | .0040         |
| 8-8                                                                                                                                                                                                                                                         | .72               | 0.08            | :50           | .90               | 1.79          | :33                              | .1547        | .0059         |
| 8-9                                                                                                                                                                                                                                                         | .28               | 0               | 10:05         | .08               | 1.81          | :35                              | .2152        | .0121         |
| 8-12                                                                                                                                                                                                                                                        | .05               | 0               | :20           | .04               | 1.82          | :37                              | .2354        | .0196         |
| 8-14                                                                                                                                                                                                                                                        | .17               | 0               |               |                   |               | :38                              | .2959        | .0240         |
| 8-16                                                                                                                                                                                                                                                        | .34               | 0               |               |                   |               | :39                              | .4035        | .0298         |
|                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | :40                              | .5380        | .0376         |
|                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | :42                              | .4116        | .0534         |
| Raingage 42                                                                                                                                                                                                                                                 |                   |                 |               |                   |               |                                  |              |               |
| 7-19-57                                                                                                                                                                                                                                                     | 0.13              |                 | 8-17-57       | Raingage 42       |               | :48                              | .4976        | .0989         |
| 7-24                                                                                                                                                                                                                                                        | .59               |                 | 8:05p         | 0                 | 0             | :52                              | .4116        | .1292         |
| 7-25                                                                                                                                                                                                                                                        | .10               |                 | :15           | 1.38              | .23           | 11:00                            | .3766        | .1817         |
| 7-26                                                                                                                                                                                                                                                        | .17               |                 | :21           | .60               | .34           | :15                              | .2556        | .2607         |
| 7-29                                                                                                                                                                                                                                                        | .58               |                 | :33           | .90               | .52           | :30                              | .1695        | .3139         |
| 7-31                                                                                                                                                                                                                                                        | .35               |                 | :40           | 4.20              | 1.01          | :40                              | .1130        | .3374         |
| 8-2                                                                                                                                                                                                                                                         | 1.18              |                 | :55           | 2.76              | 1.70          | :50                              | .0780        | .3533         |
| 8-5                                                                                                                                                                                                                                                         | .95               |                 | 9:02          | .86               | 1.80          | 8-18-57                          |              |               |
| 8-7                                                                                                                                                                                                                                                         | .05               |                 | :10           | .30               | 1.84          | 12:16a                           | .0358        | .3780         |
| 8-8                                                                                                                                                                                                                                                         | .98               |                 | :19           | .47               | 1.91          | :26                              | .0280        | .3833         |
| 8-9                                                                                                                                                                                                                                                         | .33               |                 | :35           | .34               | 2.00          | 1:08                             | .0213        | .4006         |
| 8-11                                                                                                                                                                                                                                                        | .10               |                 | :50           | .24               | 2.06          | :50                              | .0121        | .4123         |
| 8-14                                                                                                                                                                                                                                                        | .18               |                 | 10:05         | .12               | 2.09          | 2:40                             | .0073        | .4204         |
| 8-16                                                                                                                                                                                                                                                        | .08               |                 |               |                   |               | 2:55                             | .0078        | .4223         |
|                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 3:50                             | .0055        | .4284         |
|                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 5:20                             | .0051        | .4364         |
|                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 7:00                             | .0027        | .4429         |
|                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 10:00                            | .0005        | .4477         |
|                                                                                                                                                                                                                                                             |                   |                 |               |                   |               | 12:00n                           | 0            | .4481         |
| <b>WATERSHED CONDITIONS:</b> Includes watersheds 2,3,4,6,5. 65% of area supports desert shrubs (Whitehorn, creosotebush, tarbush) with 23% cover and 2% grass cover; 35% is grassland with approximately 20% grass cover (crown spread) and 5% shrub cover. |                   |                 |               |                   |               |                                  |              |               |
| <b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 37,210.                                                                                                                                                                                        |                   |                 |               |                   |               |                                  |              |               |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                         |                      |                    |                  |                      |                  | Tombstone, Arizona Watershed W-1 |                 |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                          |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                                                                                                                                                                           | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 16, 1958                                                                                                                                                                                                                                       |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage 23                                                                                                                                                                                                                                                    |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-14-58                                                                                                                                                                                                                                                        | 0.32                 | 0                  | 8-16-58          | Raingage 23          |                  | 8-16-58                          |                 |                  |
| 7-16                                                                                                                                                                                                                                                           | .03                  | 0                  | 7:00p            | 0                    | 0                | 7:40p                            | 0               | 0                |
| 7-23                                                                                                                                                                                                                                                           | .07                  | 0                  | :04              | 7.50                 | .50              | :44                              | .0132           | .0004            |
| 7-24                                                                                                                                                                                                                                                           | .15                  | 0                  | :08              | 2.70                 | .68              | :50                              | .0229           | .0022            |
| 7-29                                                                                                                                                                                                                                                           | .68                  | 0                  | :14              | 4.00                 | 1.08             | 8:02                             | .0147           | .0080            |
| 8-1                                                                                                                                                                                                                                                            | .08                  | 0                  | :20              | 2.70                 | 1.35             | :07                              | .1641           | .0155            |
| 8-2                                                                                                                                                                                                                                                            | .35                  | 0                  | :26              | 2.40                 | 1.59             | :17                              | .0995           | .0375            |
| 8-4                                                                                                                                                                                                                                                            | .02                  | 0                  | :36              | .60                  | 1.69             | :35                              | .0807           | .0645            |
| 8-5                                                                                                                                                                                                                                                            | .20                  | 0                  | :49              | .18                  | 1.73             | :50                              | .0672           | .0830            |
| 8-6                                                                                                                                                                                                                                                            | .38                  | 0                  | 8:33             | .02                  | 1.75             | 9:05                             | .0573           | .0986            |
| 8-8                                                                                                                                                                                                                                                            | .38                  | 0                  | :48              | .24                  | 1.81             | :20                              | .0487           | .1118            |
| 8-10                                                                                                                                                                                                                                                           | .28                  | 0                  | 9:22             | .04                  | 1.83             | :35                              | .0404           | .1230            |
| 8-14                                                                                                                                                                                                                                                           | 1.25                 | .08                |                  |                      |                  | :50                              | .0339           | .1323            |
|                                                                                                                                                                                                                                                                |                      |                    |                  |                      |                  | 10:05                            | .0264           | .1399            |
|                                                                                                                                                                                                                                                                |                      |                    |                  |                      |                  | :20                              | .0231           | .1461            |
| Raingage 27                                                                                                                                                                                                                                                    |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-24-58                                                                                                                                                                                                                                                        | 0.10                 |                    | 8-16-58          | Raingage 27          |                  | :35                              | .0195           | .1514            |
| 7-29                                                                                                                                                                                                                                                           | .61                  |                    | 6:50p            | 0                    | 0                | 11:05                            | .0132           | .1596            |
| 8-1                                                                                                                                                                                                                                                            | .47                  |                    | 7:00             | 1.92                 | .32              | :35                              | .0075           | .1648            |
| 8-2                                                                                                                                                                                                                                                            | .35                  |                    | :10              | 4.56                 | 1.08             | 8-17-58                          |                 |                  |
| 8-5                                                                                                                                                                                                                                                            | .20                  |                    | :20              | 1.02                 | 1.25             | 12:17a                           | .0031           | .1685            |
| 8-6                                                                                                                                                                                                                                                            | .08                  |                    | :30              | .12                  | 1.27             | 1:00                             | .0011           | .1700            |
| 8-8                                                                                                                                                                                                                                                            | .30                  |                    | 8:20             | 0                    | 1.27             | 2:00                             | .0001           | .1706            |
| 8-10                                                                                                                                                                                                                                                           | .38                  |                    | :38              | .17                  | 1.32             | 3:00                             | 0               | .1707            |
| 8-11                                                                                                                                                                                                                                                           | .06                  |                    | 9:10             | .04                  | 1.34             |                                  |                 |                  |
| 8-14                                                                                                                                                                                                                                                           | 1.53                 |                    | :20              | .36                  | 1.40             |                                  |                 |                  |
| WATERSHED CONDITIONS: Includes watersheds 2, 3, 4, & 5, 65 percent of area supports desert shrubs (Whitehorn, creosotebush, tarbush) with 23% cover and 2% grass cover; 35% is grassland with approximately 20% grass cover (crown spread) and 5% shrub cover. |                      |                    |                  |                      |                  |                                  |                 |                  |
| Event of July 26, 1959                                                                                                                                                                                                                                         |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage 36                                                                                                                                                                                                                                                    |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-1-59                                                                                                                                                                                                                                                         | 0.10                 | 0                  | 7-26-59          | Raingage 36          |                  | 7-26-59                          |                 |                  |
| 7-4                                                                                                                                                                                                                                                            | .18                  | 0                  | 8:00p            | 0                    | 0                | 9:34p                            | 0               | 0                |
| 7-8                                                                                                                                                                                                                                                            | .68                  | 0                  | :30              | 3.52                 | 1.76             | :40                              | .0942           | .0047            |
| 7-9                                                                                                                                                                                                                                                            | .04                  | 0                  | :53              | .24                  | 1.85             | :44                              | .1332           | .0123            |
| 7-13                                                                                                                                                                                                                                                           | .44                  | 0                  | 9:59             | .02                  | 1.87             | :47                              | .1022           | .0181            |
| 7-15                                                                                                                                                                                                                                                           | .21                  | 0                  | 10:40            | .03                  | 1.89             | :54                              | .1251           | .0313            |
| 7-16                                                                                                                                                                                                                                                           | .33                  | 0                  |                  |                      |                  | :57                              | .1103           | .0372            |
| 7-17                                                                                                                                                                                                                                                           | .02                  | 0                  |                  |                      |                  | 10:10                            | .0632           | .0593            |
| 7-18                                                                                                                                                                                                                                                           | .03                  | 0                  |                  |                      |                  | :19                              | .0699           | .0693            |
| 7-20                                                                                                                                                                                                                                                           | 1.94                 | 0                  |                  |                      |                  | :33                              | .0753           | .0862            |
| 7-21                                                                                                                                                                                                                                                           | 0                    | .05                |                  |                      |                  | 11:18                            | .0404           | .1296            |
| 7-23                                                                                                                                                                                                                                                           | .15                  | 0                  |                  |                      |                  | :43                              | .0320           | .1447            |
|                                                                                                                                                                                                                                                                |                      |                    |                  |                      |                  | :56                              | .0301           | .1514            |
|                                                                                                                                                                                                                                                                |                      |                    |                  |                      |                  | 7-27-59                          |                 |                  |
|                                                                                                                                                                                                                                                                |                      |                    |                  |                      |                  | 12:11a                           | .0285           | .1587            |
| Raingage 45                                                                                                                                                                                                                                                    |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-1-59                                                                                                                                                                                                                                                         | 0.18                 |                    | 7-26-59          | Raingage 45          |                  | :17                              | .0217           | .1612            |
| 7-4                                                                                                                                                                                                                                                            | .03                  |                    | 7:51p            | 0                    | 0                | :37                              | .0164           | .1675            |
| 7-13                                                                                                                                                                                                                                                           | .30                  |                    | 8:04             | 5.54                 | 1.20             | 2:36                             | .0019           | .1859            |
| 7-15                                                                                                                                                                                                                                                           | .52                  |                    | :34              | .18                  | 1.29             | 3:41                             | .0004           | .1872            |
| 7-17                                                                                                                                                                                                                                                           | .13                  |                    |                  |                      |                  | 5:11                             | 0               | .1875            |
| 7-18                                                                                                                                                                                                                                                           | .08                  |                    |                  |                      |                  |                                  |                 |                  |
| 7-20                                                                                                                                                                                                                                                           | .25                  |                    |                  |                      |                  |                                  |                 |                  |
| 7-21                                                                                                                                                                                                                                                           | 1.28                 |                    |                  |                      |                  |                                  |                 |                  |
| 7-23                                                                                                                                                                                                                                                           | 0                    |                    |                  |                      |                  |                                  |                 |                  |
| WATERSHED CONDITIONS: Includes watersheds 2,3,4,6,5. 65% of area supports desert shrubs (Whitehorn, creosotebush, tarbush) with 23% cover and 2% grass cover; 35% is grassland with approximately 20% grass cover (crown spread) and 5% shrub cover.           |                      |                    |                  |                      |                  |                                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 37,210.                                                                                                                                                                                                  |                      |                    |                  |                      |                  |                                  |                 |                  |





TOMBSTONE, ARIZONA Watershed W-1



# LEGEND

- WATERSHED BOUNDARY
- - - SUBWATERSHED BOUNDARY
- x RUNOFF MEASURING STATION
- o RECORDING RAINGAGES
- STANDARD RAINGAGES
- SECONDARY ROADS
- ++ RAILROAD
- == HIGHWAY

Note: Slope of principal channel approximately 1%



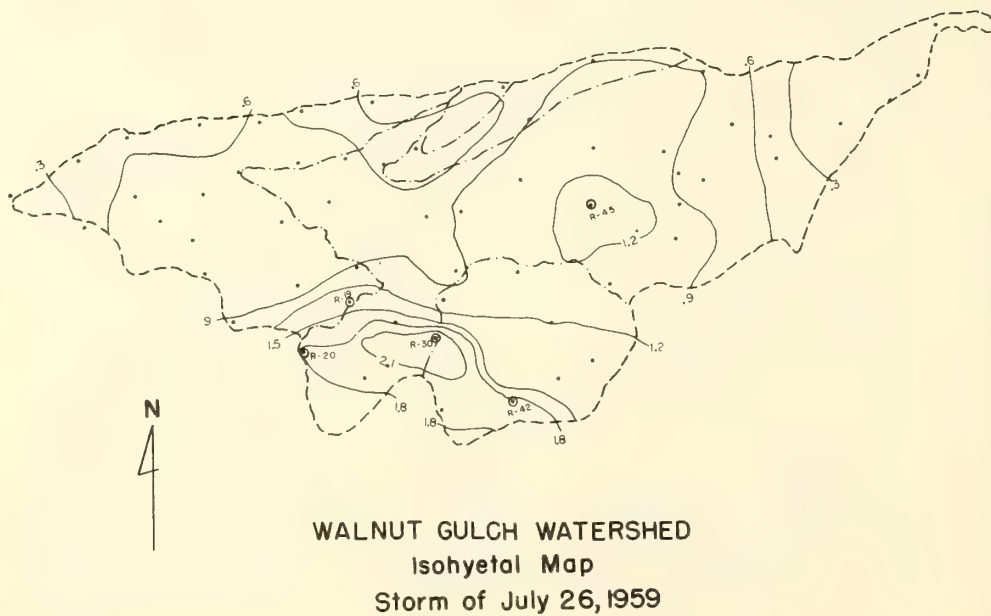
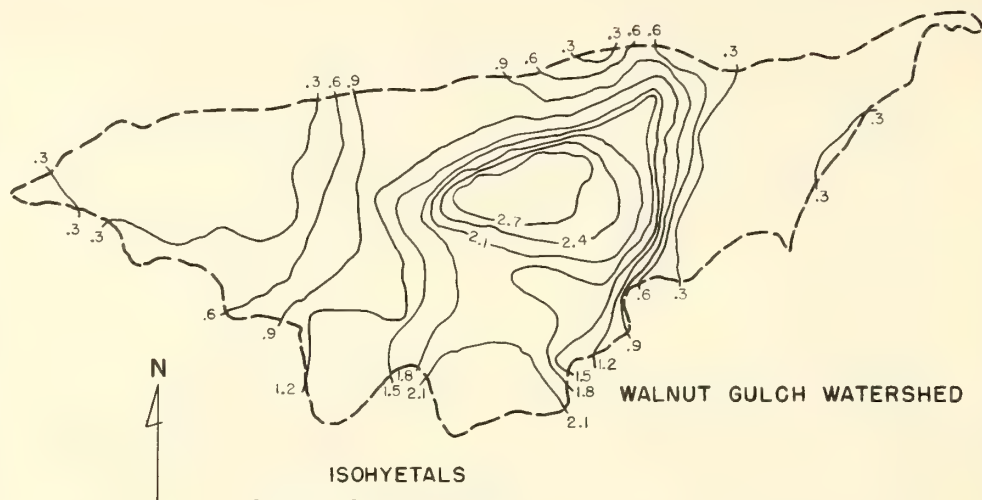
Scale in Miles

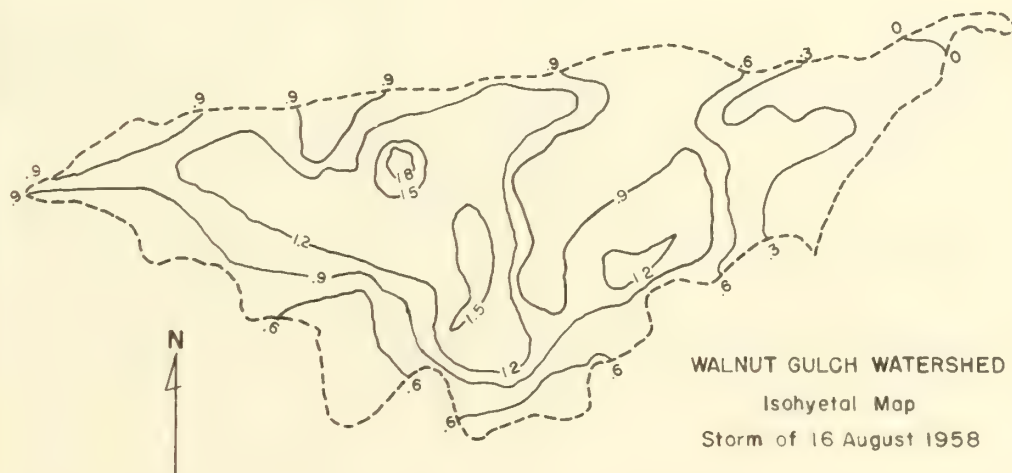
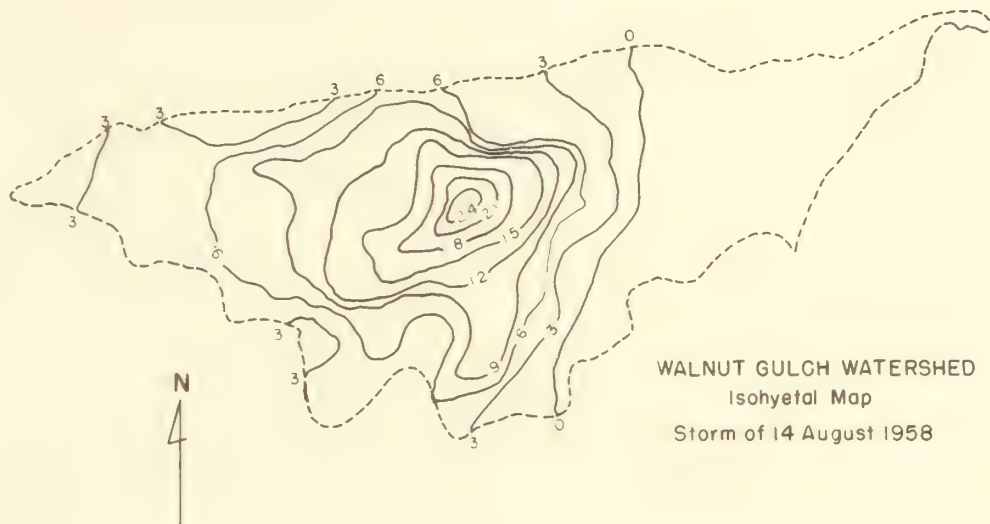
## WALNUT GULCH EXPERIMENTAL WATERSHED

TOMBSTONE, ARIZONA

WATERSHEDS W-1, 2, 3, 4 AND 5

(WALNUT GULCH EXPERIMENTAL WATERSHED)







## TOMBSTONE, ARIZONA Watershed W-2

**LOCATION:** Cochise County; at Tombstone; Walnut Gulch, tributary of the San Pedro River.

**AREA:** 43.9 sq. mi. (28,100 ac.) **SHAPE:** Butterfly, approximately 13 miles long by 6 miles wide.

**SLOPES:** Not available

Aspect W

**SOILS:** Tombstone, a gravelly loam, calcareous throughout, moderately permeable surface and subsoil -- 35%. Earp, residual on old fan material that has been consolidated to a lime conglomerate, with rhyolite the chief constituent; noncalcareous surface, moderately calcareous subsoil; moderately permeable -- 30%. Boothill, a stony clay loam developed on andesite extrusions; calcareous throughout the profile; moderately permeable -- 8%. Schieflin, developed on limestone conglomerate; calcareous surface horizon underlain by consolidated caliche -- 8%. Tortugas, developed on limestone; calcareous surface horizon underlain by consolidated caliche -- 6%. Remaining 13% accounted for by eight moderately permeable soils.

**EROSION:** 1 - 45; 2 - 50%; 3 - 5%.

**LAND CAPABILITY:** V 50%; VI 50%.

**SURFACE DRAINAGE:** Good; length of principal drainage way 17 miles.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff - critical depth flume, recorder with 8 hr. chart; Precipitation - 51 recording raingages, 24 hr. charts, 6 standard gages.

**WATERSHED CONDITIONS:** Includes watersheds 3, 4, 5. 55% of area supports desert shrubs (whitethorn, tarbush, creosotebush) with 23% cover and 2% grass cover; 45% is grassland, with 20% cover (crown spread) of grasses and 5% cover of shrubs.

**GENERALLY REPRESENTS:** Desert grassland ranges in the Southeastern Arizona Basin and Range resource area (D-41).

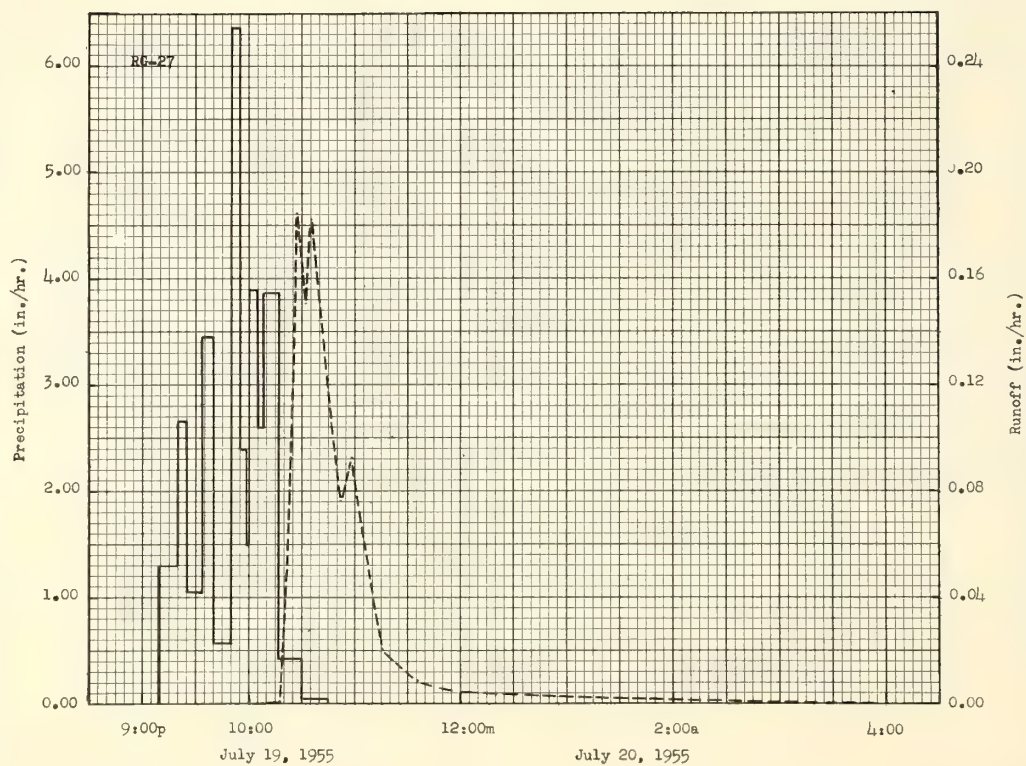
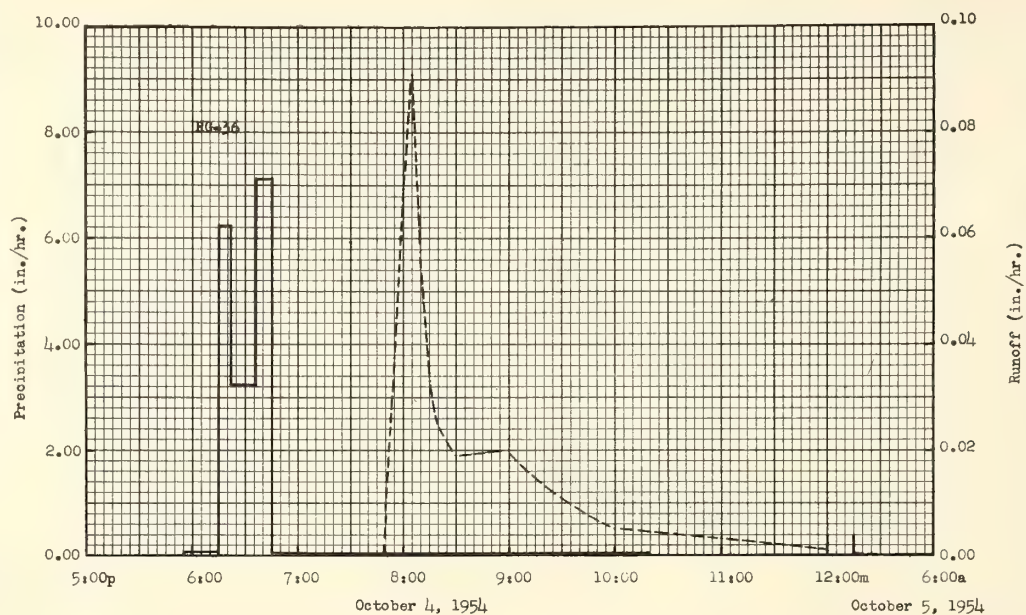
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                               |                   |        |                                           |        |         |        |         | Tombstone, Arizona Watershed W-2 |          |        |       |        |        |        |        |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------|-------------------------------------------|--------|---------|--------|---------|----------------------------------|----------|--------|-------|--------|--------|--------|--------|--------|
| Month<br>Year                                                                                                                                                                                           | Jan.              | Feb.   | Mar.                                      | Apr.   | May     | June   | July    | Aug.                             | Sept.    | Oct.   | Nov.  | Dec.   | Year   |        |        |        |
| 1954 P                                                                                                                                                                                                  | 0.55              | 0.22   | 0.34                                      | 0      | 0.58    | 1.37   | 2.11    | 5.29                             | 0.57     | 0.87   | 0     | 0.02   | 11.92  |        |        |        |
| Q                                                                                                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | .01    | .04     | .22                              | 0        | .05    | 0     | 0      | .32    |        |        |        |
| 1955 P                                                                                                                                                                                                  | 1.38              | .25    | .35                                       | 0      | .03     | .41    | 8.40    | 3.71                             | .22      | .16    | .06   | .24    | 15.21  |        |        |        |
| Q                                                                                                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | 0      | .89     | .10                              | 0        | 0      | 0     | 0      | .99    |        |        |        |
| 1956 P                                                                                                                                                                                                  | .65               | .30    | 0                                         | .17    | .01     | .59    | 4.49    | .91                              | .01      | .24    | .05   | .15    | 7.57   |        |        |        |
| Q                                                                                                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | 0      | .05     | 0                                | 0        | 0      | 0     | 0      | .05    |        |        |        |
| 1957 P                                                                                                                                                                                                  | 1.53              | .09    | 1.34                                      | .05    | .23     | .45    | 2.27    | 4.92                             | .02      | 1.40   | .07   | .29    | 12.66  |        |        |        |
| Q                                                                                                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | 0      | 0       | .79                              | 0        | 0      | 0     | 0      | .79    |        |        |        |
| 1958 P                                                                                                                                                                                                  | 0                 | 1.16   | 1.95                                      | .63    | .01     | .14    | 1.43    | 4.92                             | 2.05     | .96    | .38   | 0      | 13.63  |        |        |        |
| Q                                                                                                                                                                                                       | NR                | NR     | NR                                        | NR     | NR      | NR     | NR      | NR                               | NR       | NR     | NR    | NR     | NR     |        |        |        |
| 1959 P                                                                                                                                                                                                  | 0                 | .40    | 0                                         | .07    | 0       | .95    | 4.73    | 3.71                             | .59      | 1.18   | .86   | .88    | 13.37  |        |        |        |
| Q                                                                                                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | 0      | .28     | .12                              | .01      | 0      | 0     | 0      | .41    |        |        |        |
| Normal P                                                                                                                                                                                                | .86               | .82    | .61                                       | .29    | .20     | .51    | 3.68    | 3.50                             | 1.53     | .64    | .63   | .87    | 14.14  |        |        |        |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                 |                   |        |                                           |        |         |        |         | Tombstone, Arizona Watershed W-2 |          |        |       |        |        |        |        |        |
| YEAR                                                                                                                                                                                                    | MAXIMUM DISCHARGE |        | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
|                                                                                                                                                                                                         |                   |        | 1 hour                                    |        | 2 hours |        | 6 hours |                                  | 12 hours |        | 1 day |        | 2 days |        | 8 days |        |
|                                                                                                                                                                                                         | Date              | Rate   | Date                                      | Vol.   | Date    | Vol.   | Date    | Vol.                             | Date     | Vol.   | Date  | Vol.   | Date   | Vol.   | Date   | Vol.   |
| 1954                                                                                                                                                                                                    | 10-4              | 0.1024 | 10-4                                      | 0.0285 | 10-4    | 0.0470 | 10-4    | 0.0534                           | 10-4     | 0.0534 | 8-3   | 0.0713 | 8-3    | 0.0713 | 8-3    | 0.1202 |
| 1955                                                                                                                                                                                                    | 7-25              | .4448  | 7-25                                      | .2462  | 7-25    | .3565  | 7-25    | .4343                            | 7-25     | .4343  | 7-25  | .4774  | 7-25   | .5227  | 7-19   | .8394  |
| 1956                                                                                                                                                                                                    | 7-19              | .0149  | 7-19                                      | .0084  | 7-19    | .0133  | 7-19    | .0181                            | 7-19     | .0182  | 7-19  | .0182  | 7-19   | .0255  | 7-19   | .0298  |
| 1957                                                                                                                                                                                                    | 8-17              | .6707  | 8-17                                      | .4315  | 8-17    | .5845  | 8-17    | .6682                            | 8-17     | .6682  | 8-17  | .6682  | 8-17   | .6682  | 8-10   | .6703  |
| 1958                                                                                                                                                                                                    | NR                |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
| 1959                                                                                                                                                                                                    | 7-26              | .1298  | 7-26                                      | .1009  | 7-26    | .1397  | 7-26    | .1692                            | 7-26     | .1692  | 7-26  | .1692  | 7-26   | .1692  | 7-20   | .2260  |
| Notes: Quality of record: P, poor in 1954; fair in 1955; good, 1956 through 1959. Q, fair in 1954; poor, 1955 through 1957; no record 1958; good in 1959. Monthly P is arithmetic average of raingages. |                   |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
| Normal P based on 60 years record (1897-1957), USWB Station, Tombstone, Arizona.                                                                                                                        |                   |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |



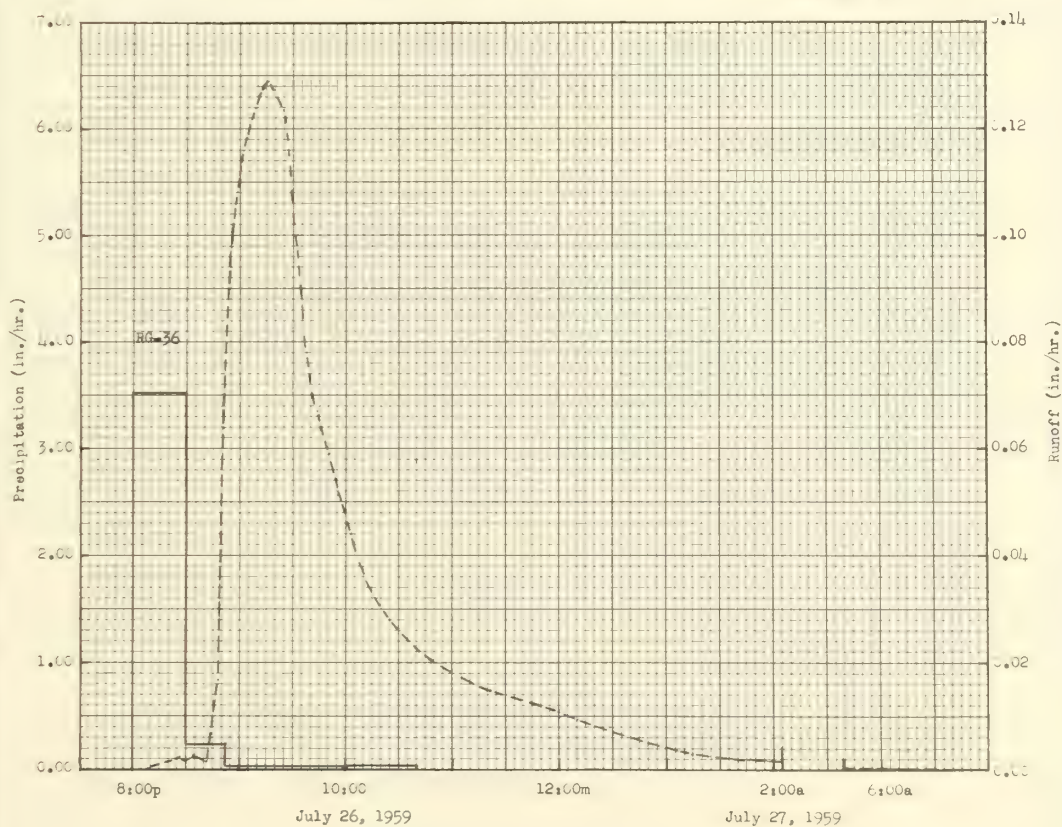
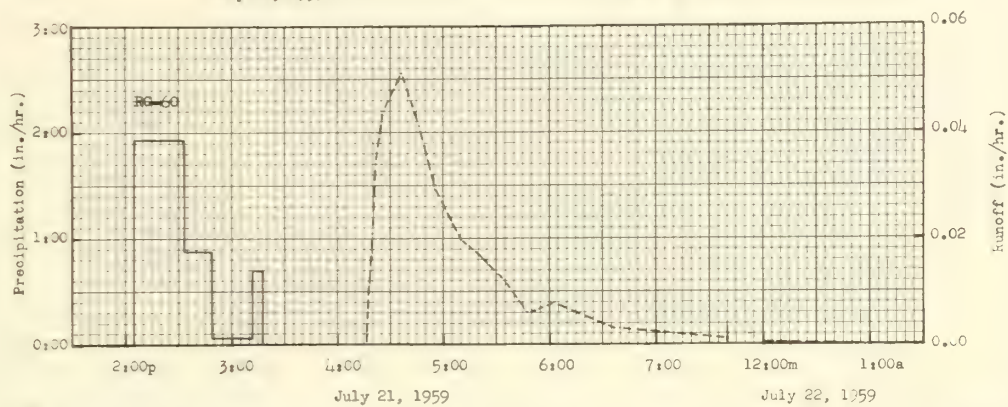
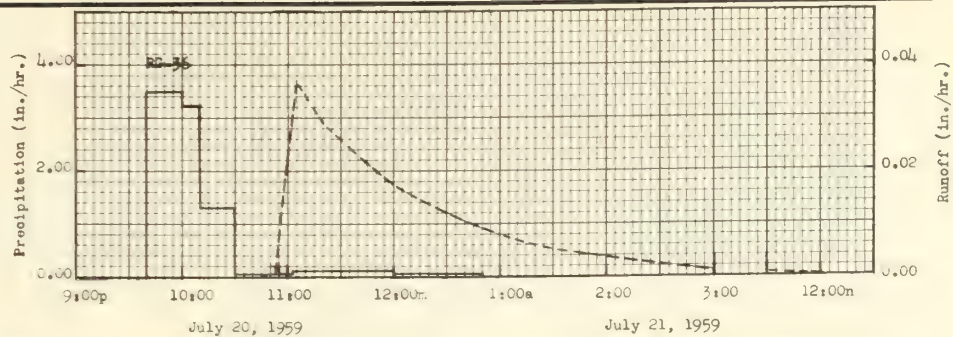
| SELECTED RUNOFF EVENTS                                        |                      |                    |                  |                      |                  | Tombstone, Arizona Watershed W-2                                                                                                                                                                                                                                      |                 |                  |
|---------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|
| Antecedent conditions                                         |                      |                    | Rainfall         |                      |                  | Runoff                                                                                                                                                                                                                                                                |                 |                  |
| Date                                                          | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                                                                                                                                                                                                                                                      | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 20, 1959                                        |                      |                    |                  |                      |                  |                                                                                                                                                                                                                                                                       |                 |                  |
| Raingage 36                                                   |                      |                    |                  |                      |                  |                                                                                                                                                                                                                                                                       |                 |                  |
| 6-29-59                                                       | 1.12                 | 0                  | 7-20-59          | Raingage             | 36               | 7-20-59                                                                                                                                                                                                                                                               |                 |                  |
| 7-1                                                           | .10                  | 0                  | 9:41p            | 0                    | 0                | 10:53p                                                                                                                                                                                                                                                                | 0               | 0                |
| 7-5                                                           | .18                  | 0                  | 10:00            | 3.48                 | 1.10             | :55                                                                                                                                                                                                                                                                   | .0004           | 0                |
| 7-8                                                           | .68                  | 0                  | :10              | 3.24                 | 1.64             | 11:00                                                                                                                                                                                                                                                                 | .0229           | .0010            |
| 7-9                                                           | .04                  | 0                  | :30              | 1.32                 | 1.97             | :05                                                                                                                                                                                                                                                                   | .0376           | .0035            |
| 7-13                                                          | .44                  | 0                  | 11:03            | .05                  | 2.00             | :10                                                                                                                                                                                                                                                                   | .0335           | .0065            |
| 7-15                                                          | .21                  | 0                  | 12:00m           | .09                  | 2.09             | :20                                                                                                                                                                                                                                                                   | .0291           | .0117            |
| 7-16                                                          | .33                  | 0                  | 7-21-59          |                      |                  | :40                                                                                                                                                                                                                                                                   | .0220           | .0202            |
| 7-17                                                          | .02                  | 0                  | 12:50a           | .05                  | 2.13             | 12:00m                                                                                                                                                                                                                                                                | .0179           | .0269            |
| 7-18                                                          | .03                  | 0                  |                  |                      |                  | 7-21-59                                                                                                                                                                                                                                                               |                 |                  |
| Raingage 45                                                   |                      |                    |                  |                      |                  | 12:20a                                                                                                                                                                                                                                                                | .0153           | .0324            |
| 6-29-59                                                       | 1.75                 |                    | 7-20-59          | Raingage             | 36               | :40                                                                                                                                                                                                                                                                   | .0115           | .0369            |
| 7-1                                                           | .05                  |                    | 9:32p            | 0                    | 0                | 1:00                                                                                                                                                                                                                                                                  | .0083           | .0402            |
| 7-3                                                           | .53                  |                    | :38              | 1.80                 | .18              | :30                                                                                                                                                                                                                                                                   | .0047           | .0435            |
| 7-13                                                          | .32                  |                    | :45              | .09                  | .19              | 2:00                                                                                                                                                                                                                                                                  | .0028           | .0454            |
| 7-15                                                          | .25                  |                    | :52              | 2.06                 | .43              | 3:00                                                                                                                                                                                                                                                                  | .0011           | .0474            |
| 7-16                                                          | .10                  |                    | 10:10            | .30                  | .52              | 4:00                                                                                                                                                                                                                                                                  | .0004           | .0482            |
| 7-17                                                          | .06                  |                    | :50              | .02                  | .53              | 6:00                                                                                                                                                                                                                                                                  | .0001           | .0488            |
| 7-18                                                          | .06                  |                    | 12:00m           | .08                  | .62              | 8:00                                                                                                                                                                                                                                                                  | .0000           | .0490            |
|                                                               |                      |                    |                  |                      |                  | 12:00n                                                                                                                                                                                                                                                                | 0               | .0490            |
| Raingage 60                                                   |                      |                    |                  |                      |                  | WATERSHED CONDITIONS: Includes<br>watersheds 3,4,6,5. 55% of area<br>supports desert shrubs (White-<br>horn, tarbush, creosotebush)<br>with 23% cover and 2% grass<br>cover; 45% is grassland, with<br>20% cover (crown spread) of<br>grasses and 5% cover of shrubs. |                 |                  |
| 6-29-59                                                       | 0.55                 |                    | 7-20-59          | Raingage             | 60               |                                                                                                                                                                                                                                                                       |                 |                  |
| 6-30                                                          | .04                  |                    | 9:20p            | 0                    | 0                |                                                                                                                                                                                                                                                                       |                 |                  |
| 7-1                                                           | .18                  |                    | :32              | .75                  | .15              |                                                                                                                                                                                                                                                                       |                 |                  |
| 7-4                                                           | .03                  |                    | 10:00            | .11                  | .20              |                                                                                                                                                                                                                                                                       |                 |                  |
| 7-13                                                          | .30                  |                    | 12:00m           | .02                  | .23              |                                                                                                                                                                                                                                                                       |                 |                  |
| 7-15                                                          | .52                  |                    | 7-21-59          |                      |                  |                                                                                                                                                                                                                                                                       |                 |                  |
| 7-17                                                          | .13                  |                    | 12:15a           | .08                  | .25              |                                                                                                                                                                                                                                                                       |                 |                  |
| 7-18                                                          | .08                  |                    |                  |                      |                  |                                                                                                                                                                                                                                                                       |                 |                  |
| Event of July 21, 1959                                        |                      |                    |                  |                      |                  |                                                                                                                                                                                                                                                                       |                 |                  |
| Same as above                                                 |                      |                    | 7-21-59          | Raingage             | 36               | 7-21-59                                                                                                                                                                                                                                                               |                 |                  |
|                                                               |                      |                    |                  | 0                    | 0                | 4:17p                                                                                                                                                                                                                                                                 | 0               | 0                |
|                                                               |                      |                    |                  |                      |                  | :18                                                                                                                                                                                                                                                                   | .0026           | 0                |
|                                                               |                      |                    |                  |                      |                  | :20                                                                                                                                                                                                                                                                   | .0217           | .0003            |
|                                                               |                      |                    |                  |                      |                  | :22                                                                                                                                                                                                                                                                   | .0348           | .0012            |
|                                                               |                      |                    | 7-21-59          | Raingage             | 45               | :27                                                                                                                                                                                                                                                                   | .0446           | .0032            |
|                                                               |                      |                    | 2:45p            | 0                    | 0                | :37                                                                                                                                                                                                                                                                   | .0516           | .0112            |
|                                                               |                      |                    | 3:10             | 1.30                 | .65              | :47                                                                                                                                                                                                                                                                   | .0412           | .0189            |
|                                                               |                      |                    | 3:30             | .27                  | .74              | :55                                                                                                                                                                                                                                                                   | .0301           | .0237            |
|                                                               |                      |                    |                  |                      |                  | 5:11                                                                                                                                                                                                                                                                  | .0205           | .0304            |
|                                                               |                      |                    | 7-21-59          | Raingage             | 60               | :21                                                                                                                                                                                                                                                                   | .0173           | .0336            |
|                                                               |                      |                    | 2:04             | 0                    | 0                | :35                                                                                                                                                                                                                                                                   | .0122           | .0370            |
|                                                               |                      |                    | :33              | 1.97                 | .79              | :48                                                                                                                                                                                                                                                                   | .0066           | .0390            |
|                                                               |                      |                    | :48              | .84                  | 1.00             | 6:03                                                                                                                                                                                                                                                                  | .0082           | .0408            |
|                                                               |                      |                    | 3:12             | .05                  | 1.02             | :40                                                                                                                                                                                                                                                                   | .0033           | .0444            |
|                                                               |                      |                    | :18              | .60                  | 1.08             | 7:10                                                                                                                                                                                                                                                                  | .0020           | .0458            |
|                                                               |                      |                    |                  |                      |                  | :40                                                                                                                                                                                                                                                                   | .0015           | .0467            |
|                                                               |                      |                    |                  |                      |                  | 8:18                                                                                                                                                                                                                                                                  | .0009           | .0475            |
|                                                               |                      |                    |                  |                      |                  | 9:00                                                                                                                                                                                                                                                                  | .0005           | .0480            |
|                                                               |                      |                    |                  |                      |                  | :36                                                                                                                                                                                                                                                                   | .0002           | .0482            |
|                                                               |                      |                    |                  |                      |                  | 10:48                                                                                                                                                                                                                                                                 | .0001           | .0485            |
|                                                               |                      |                    |                  |                      |                  | 11:15                                                                                                                                                                                                                                                                 | .0001           | .0486            |
|                                                               |                      |                    |                  |                      |                  | 7-22-59                                                                                                                                                                                                                                                               |                 |                  |
|                                                               |                      |                    |                  |                      |                  | 10:40a                                                                                                                                                                                                                                                                | .0000           | .0487            |
|                                                               |                      |                    |                  |                      |                  | 1:05                                                                                                                                                                                                                                                                  | 0               | .0487            |
| Notes: To convert runoff in in/hr to cfs, multiply by 28,330. |                      |                    |                  |                      |                  |                                                                                                                                                                                                                                                                       |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                          |                      |                    |                  |                      |                  | Tombstone, Arizona Watershed W-2 |                 |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                           |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                                                                                                                                                            | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 26, 1959                                                                                                                                                                                                                          |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage 36                                                                                                                                                                                                                                     |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-1-59                                                                                                                                                                                                                                          | 0.10                 | 0                  | 7-26-59          | Raingage 36          |                  | 7-26-59                          |                 |                  |
| 7-4                                                                                                                                                                                                                                             | .18                  | 0                  | 8:00p            | 0                    | 0                | 8:09p                            | 0               | 0                |
| 7-8                                                                                                                                                                                                                                             | .68                  | 0                  | :30              | 3.52                 | 1.76             | :15                              | .0001           | 0                |
| 7-9                                                                                                                                                                                                                                             | .04                  | 0                  | :53              | .24                  | 1.85             | :20                              | .0001           | 0                |
| 7-13                                                                                                                                                                                                                                            | .44                  | 0                  | 9:59             | .02                  | 1.87             | :25                              | .0017           | .0001            |
| 7-15                                                                                                                                                                                                                                            | .21                  | 0                  | 10:40            | .03                  | 1.89             | :27                              | .0021           | .0002            |
| 7-16                                                                                                                                                                                                                                            | .33                  | 0                  |                  |                      |                  | :29                              | .0019           | .0003            |
| 7-17                                                                                                                                                                                                                                            | .02                  | 0                  |                  |                      |                  | :32                              | .0021           | .0004            |
| 7-18                                                                                                                                                                                                                                            | .03                  | 0                  |                  |                      |                  | :34                              | .0024           | .0005            |
| 7-20                                                                                                                                                                                                                                            | 1.94                 | .05                |                  |                      |                  | :475                             | .0017           | .0010            |
| 7-21                                                                                                                                                                                                                                            |                      | .05                |                  |                      |                  | :48                              | .0173           | .0011            |
| 7-23                                                                                                                                                                                                                                            | .15                  | 0                  |                  |                      |                  | :50                              | .0524           | .0023            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | :51                              | .0642           | .0033            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | :55                              | .0983           | .0087            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | :58                              | .1084           | .0139            |
| Raingage 45                                                                                                                                                                                                                                     |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-1-59                                                                                                                                                                                                                                          | 0.05                 |                    | 7-26-59          | Raingage 45          |                  | 9:02                             | .1160           | .0214            |
| 7-3                                                                                                                                                                                                                                             | .53                  |                    | 7:51p            | 0                    | 0                | :09                              | .1246           | .0354            |
| 7-13                                                                                                                                                                                                                                            | .32                  |                    | 8:04             | 5.54                 | 1.20             | :16                              | .1298           | .0502            |
| 7-15                                                                                                                                                                                                                                            | .25                  |                    | :34              | .18                  | 1.29             | :25                              | .1138           | .0685            |
| 7-16                                                                                                                                                                                                                                            | .10                  |                    |                  |                      |                  | :32                              | .0983           | .0809            |
| 7-17                                                                                                                                                                                                                                            | .06                  |                    |                  |                      |                  | :38                              | .0780           | .0897            |
| 7-18                                                                                                                                                                                                                                            | .06                  |                    |                  |                      |                  | :44                              | .0670           | .0969            |
| 7-20                                                                                                                                                                                                                                            | .66                  |                    |                  |                      |                  | :51                              | .0591           | .1043            |
| 7-21                                                                                                                                                                                                                                            | .86                  |                    |                  |                      |                  | 10:01                            | .0497           | .1134            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | :03                              | .0442           | .1150            |
| Raingage 60                                                                                                                                                                                                                                     |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-1-59                                                                                                                                                                                                                                          | 0.18                 |                    | 7-26-59          | Raingage 60          |                  | :11                              | .0372           | .1204            |
| 7-4                                                                                                                                                                                                                                             | .03                  |                    | 7:54p            | 0                    | 0                | :20                              | .0331           | .1257            |
| 7-13                                                                                                                                                                                                                                            | .30                  |                    | 8:03             | 1.80                 | .27              | :25                              | .0282           | .1283            |
| 7-15                                                                                                                                                                                                                                            | .52                  |                    | :42              | .14                  | .36              | :425                             | .0227           | .1357            |
| 7-17                                                                                                                                                                                                                                            | .13                  |                    |                  |                      |                  | 11:22                            | .0153           | .1450            |
| 7-18                                                                                                                                                                                                                                            | .08                  |                    |                  |                      |                  | :58                              | .0123           | .1461            |
| 7-20                                                                                                                                                                                                                                            | .25                  |                    |                  |                      |                  | 7-27-59                          |                 |                  |
| 7-21                                                                                                                                                                                                                                            | 1.28                 |                    |                  |                      |                  | 12:10a                           | .0113           | .1467            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | :10                              | .0098           | .1483            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | :29                              | .0080           | .1511            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | :33                              | .0069           | .1516            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | 1:14                             | .0028           | .1549            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | :30                              | .0023           | .1556            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | :47                              | .0019           | .1562            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | 2:25                             | .0015           | .1573            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | 3:00                             | .0008           | .1580            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | 4:00                             | .0003           | .1586            |
|                                                                                                                                                                                                                                                 |                      |                    |                  |                      |                  | 6:45                             | 0               | .1591            |
| WATERSHED CONDITIONS: Includes watersheds 3,4,6,5. 55% of area supports desert shrubs (White-horn, tarbush, creosotebush) with 23% cover and 2% grass cover; 45% is grassland, with 20% cover (crown spread) of grasses and 5% cover of shrubs. |                      |                    |                  |                      |                  |                                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 28,330.<br>See 63.1-6 for isohyetal map of this event.                                                                                                                                    |                      |                    |                  |                      |                  |                                  |                 |                  |

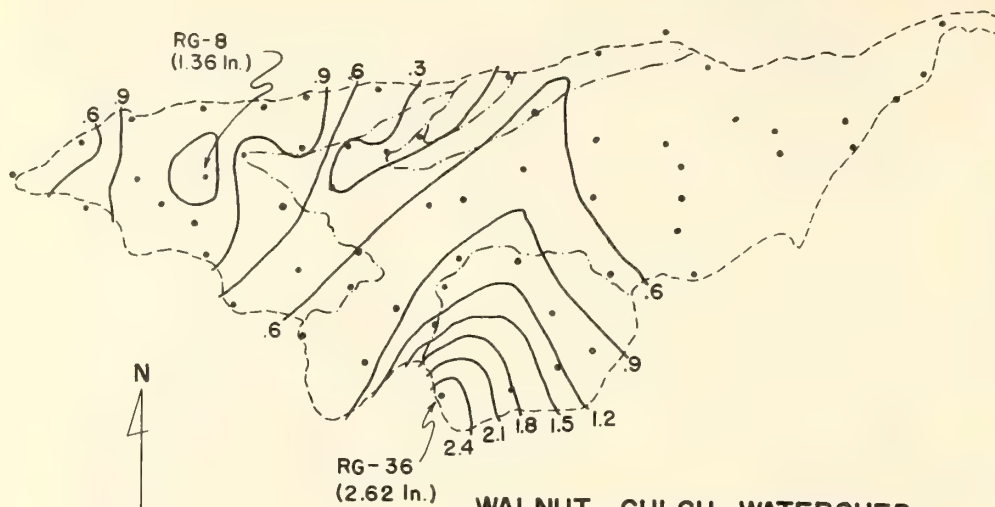




TOMBSTONE, ARIZONA Watershed W-2

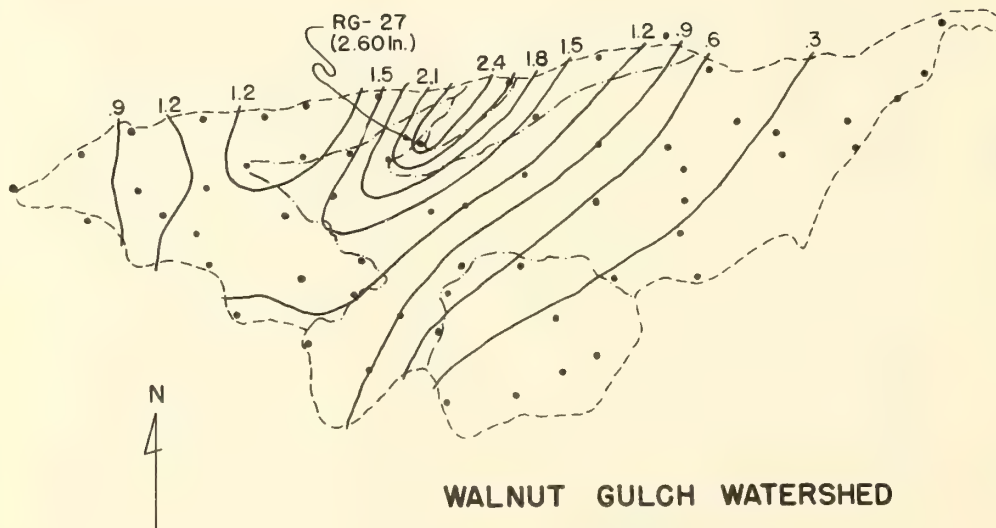


TOMBSTONE, ARIZONA Watershed W-2



**WALNUT GULCH WATERSHED**  
**Isohyetal Map**

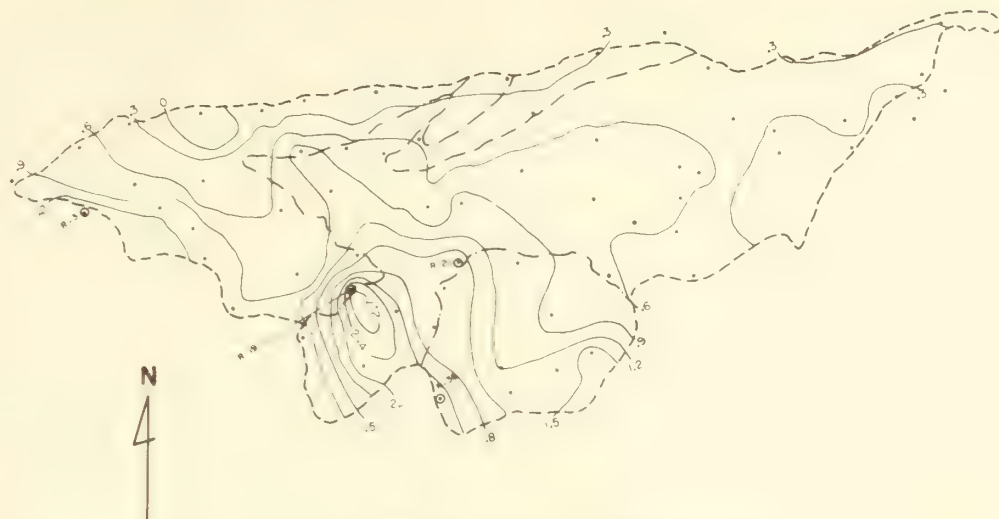
STORM OF OCTOBER 4, 1954



**WALNUT GULCH WATERSHED**  
**Isohyetal Map**

STORM OF JULY 19, 1955





WALNUT GULCH WATERSHED  
Isohyetal Map  
Storm of July 20, 1959



WALNUT GULCH WATERSHED  
Isohyetal Map  
Storm of July 21, 1959



## TOMBSTONE, ARIZONA Watershed W-3

**LOCATION:** Cochise County; 2 miles north of Tombstone; tributary of Walnut Gulch; tributary of San Pedro River.

**AREA:** 3.47 sq. mi (2220 ac.) **SHAPE:** Long and narrow, approximately 5 miles long by 1 mile wide.

**SLOPES:** Not available.

Aspect WSW

**SOILS:** Tombstone 55%, Earp 45% (see W-1 and 2 for descriptions).

**EROSION:** 1 - 45%; 2 - 55%.

**LAND CAPABILITY:** V 45%; VI 55%.

**SURFACE DRAINAGE:** Good; length of principal drainage  $5\frac{1}{2}$  miles.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff - critical depth flume, recorder with 8 hr. chart; Precipitation - 6 recording raingages.

**WATERSHED CONDITIONS:** 55% supports desert shrubs with a cover of 23% with a grass understory of 2%. 45% grassland with a grass canopy of 20%.

**GENERALLY REPRESENTS:** Desert grassland ranges in the Southeastern Arizona Basin and Range resource area (D-41).

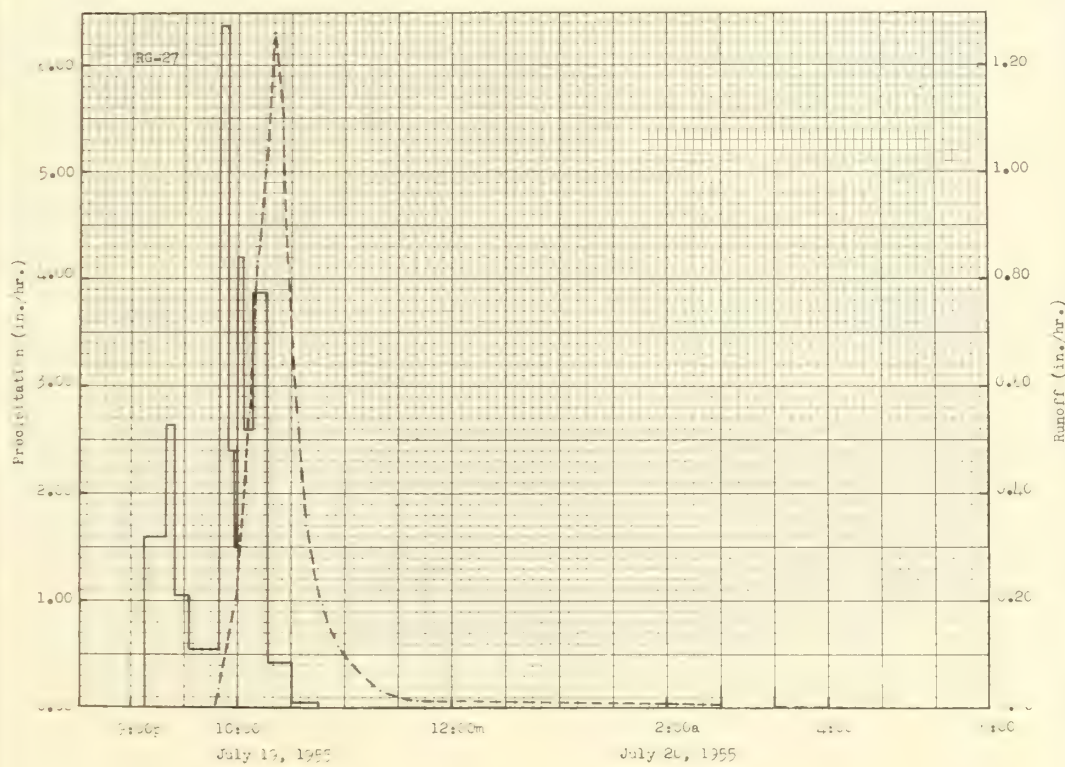
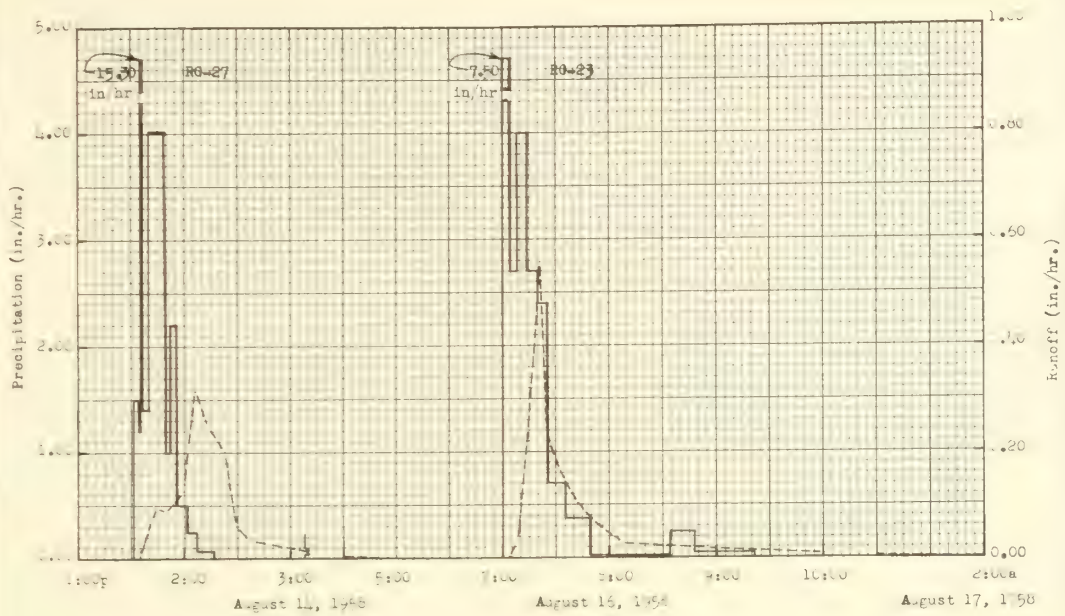
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                   |                   |        |                                           |        |         |        |                                  | Tombstone, Arizona Watershed W-3 |          |        |       |        |        |        |        |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------|-------------------------------------------|--------|---------|--------|----------------------------------|----------------------------------|----------|--------|-------|--------|--------|--------|--------|--------|
| Month<br>Year                                                                                                                                                                               | Jan.              | Feb.   | Mar.                                      | Apr.   | May     | June   | July                             | Aug.                             | Sept.    | Oct.   | Nov.  | Dec.   | Year   |        |        |        |
| 1954 P                                                                                                                                                                                      |                   |        |                                           |        | NR      | NR     | NR                               | 6.71                             | 0.42     | 0.39   | 0     | 0.14   | Inc.   |        |        |        |
| Q                                                                                                                                                                                           |                   |        |                                           |        | 0       | 0      | 0                                | .33                              | 0        | 0      | 0     | 0      | .33    |        |        |        |
| 1955 P                                                                                                                                                                                      | 1.22              | 0.23   | 0.25                                      | 0      | 0       | 0.42   | 9.80                             | 3.52                             | .36      | .11    | .04   | .26    | 16.21  |        |        |        |
| Q                                                                                                                                                                                           | 0                 | 0      | 0                                         | 0      | 0       | 0      | 3.16                             | .06                              | 0        | 0      | 0     | 0      | 3.22   |        |        |        |
| 1956 P                                                                                                                                                                                      | .69               | .34    | 0                                         | .22    | 0       | .42    | 5.00                             | .86                              | 0        | .35    | .10   | .13    | 8.11   |        |        |        |
| Q                                                                                                                                                                                           | NR                | NR     | NR                                        | NR     | NR      | NR     | NR                               | NR                               | NR       | NR     | NR    | NR     | NR     |        |        |        |
| 1957 P                                                                                                                                                                                      | 1.42              | .15    | 1.22                                      | .05    | .43     | .45    | 1.73                             | 3.68                             | .02      | 1.34   | .12   | .34    | 10.95  |        |        |        |
| Q                                                                                                                                                                                           | NR                | NR     | NR                                        | NR     | NR      | NR     | NR                               | NR                               | NR       | NR     | NR    | NR     | NR     |        |        |        |
| 1958 P                                                                                                                                                                                      | 0                 | 1.32   | 1.75                                      | .86    | .01     | .18    | 1.23                             | 5.91                             | 1.67     | .92    | .32   | 0      | 14.17  |        |        |        |
| Q                                                                                                                                                                                           | 0                 | 0      | 0                                         | 0      | 0       | 0      | 0                                | .53                              | 0        | 0      | 0     | 0      | .53    |        |        |        |
| 1959 P                                                                                                                                                                                      | 0                 | .45    | 0                                         | .24    | 0       | .70    | 3.79                             | 4.00                             | .68      | .85    | .96   | .87    | 12.54  |        |        |        |
| Q                                                                                                                                                                                           | 0                 | 0      | 0                                         | 0      | 0       | 0      | .03                              | .04                              | 0        | 0      | 0     | 0      | .07    |        |        |        |
| Normal P                                                                                                                                                                                    | .86               | .82    | .61                                       | .29    | .20     | .51    | 3.68                             | 3.50                             | 1.53     | .64    | .63   | .87    | 14.14  |        |        |        |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                     |                   |        |                                           |        |         |        | Tombstone, Arizona Watershed W-3 |                                  |          |        |       |        |        |        |        |        |
| YEAR                                                                                                                                                                                        | MAXIMUM DISCHARGE |        | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |        |         |        |                                  |                                  |          |        |       |        |        |        |        |        |
|                                                                                                                                                                                             |                   |        | 1 hour                                    |        | 2 hours |        | 6 hours                          |                                  | 12 hours |        | 1 day |        | 2 days |        | 8 days |        |
|                                                                                                                                                                                             | Date              | Rate   | Date                                      | Vol.   | Date    | Vol.   | Date                             | Vol.                             | Date     | Vol.   | Date  | Vol.   | Date   | Vol.   | Date   | Vol.   |
| 1954                                                                                                                                                                                        | 8-19              | 0.2300 | 8-19                                      | 0.1507 | 8-19    | 0.1815 | 8-19                             | 0.2070                           | 8-19     | 0.2072 | 8-19  | 0.2072 | 8-19   | 0.2072 | 8-11   | 0.2834 |
| 1955                                                                                                                                                                                        | 7-19              | 1.2750 | 7-19                                      | .5750  | 7-22    | .7565  | 7-22                             | .8450                            | 7-22     | .8456  | 7-19  | 1.2520 | 7-19   | 1.2520 | 7-19   | 2.9288 |
| 1956                                                                                                                                                                                        | 7-29              | .0260  | Incomplete Record                         |        |         |        |                                  |                                  |          |        |       |        |        |        |        |        |
| 1957                                                                                                                                                                                        | 8-17              | .0699  | Incomplete Record                         |        |         |        |                                  |                                  |          |        |       |        |        |        |        |        |
| 1958                                                                                                                                                                                        | 8-16              | .5638  | 8-16                                      | .1532  | 8-16    | .1681  | 8-16                             | .1906                            | 8-16     | .1906  | 8-16  | .1906  | 8-16   | .1906  | 8-14   | .3485  |
| 1959                                                                                                                                                                                        | 8-17              | .0767  | 8-17                                      | .0267  | 8-17    | .0269  | 8-17                             | .0269                            | 8-17     | .0269  | 8-17  | .0269  | 8-17   | .0277  | 8-13   | .0436  |
| Notes: Quality of record: P, fair in 1954 and 1955; good 1956 through 1959. Q, fair in 1954; poor, 1955 through 1957; good, in 1958 and 1959. Monthly P is arithmetic average of raingages. |                   |        |                                           |        |         |        |                                  |                                  |          |        |       |        |        |        |        |        |
| Normal P based on 60 years record (1897-1957), USWB Station, Tombstone, Arizona.                                                                                                            |                   |        |                                           |        |         |        |                                  |                                  |          |        |       |        |        |        |        |        |

| SELECTED RUNOFF EVENTS                                                                                                                        |                      |                    |                  |                      |                  | Tombstone, Arizona Watershed W-3 |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                         |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                                                          | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 19, 1955                                                                                                                        |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage 23                                                                                                                                   |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-12-55                                                                                                                                       | 0.93                 |                    | 7-19-55          | Raingage             | 23               | 7-19-55                          |                 |                  |
| 7-14                                                                                                                                          | .05                  |                    | 9:05p            | 0                    | 0                | 9:48p                            | 0               | 0                |
| 7-15                                                                                                                                          | .27                  | 0                  | :10              | .84                  | .07              | :49                              | .0350           | .0003            |
| 7-17                                                                                                                                          | .02                  | 0                  | :38              | .60                  | .33              | :58                              | .1971           | .0177            |
| 7-18                                                                                                                                          | .02                  |                    | :54              | 2.11                 | .90              | 10:06                            | .5440           | .0604            |
|                                                                                                                                               |                      |                    | 10:07            | 3.64                 | 1.75             | :09                              | .7152           | .0919            |
|                                                                                                                                               |                      |                    | 10:20            | 1.38                 | 2.65             | :11                              | .8274           | .1176            |
|                                                                                                                                               |                      |                    | 11:00            | .01                  | 2.06             | :16                              | 1.0093          | .1941            |
|                                                                                                                                               |                      |                    |                  |                      |                  | :19                              | 1.2637          | .2509            |
|                                                                                                                                               |                      |                    |                  |                      |                  | :25                              | 1.0978          | .3690            |
| Raingage 27                                                                                                                                   |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-12-55                                                                                                                                       | .86                  |                    | 7-19-55          | Raingage             | 27               | :28                              | .8113           | .4167            |
| 7-14                                                                                                                                          | .21                  |                    | 9:08p            | 0                    | 0                | :34                              | .5386           | .4842            |
| 7-15                                                                                                                                          | .30                  |                    | :20              | 1.30                 | .26              | :38                              | .3428           | .5136            |
| 7-16                                                                                                                                          | .06                  |                    | :25              | 1.64                 | .48              | :47                              | .1971           | .5541            |
| 7-17                                                                                                                                          | .05                  |                    | :33              | 1.05                 | .62              | :56                              | .1070           | .5769            |
| 7-18                                                                                                                                          | .04                  |                    | :50              | .56                  | .78              | 11:20                            | .0354           | .6054            |
|                                                                                                                                               |                      |                    | :55              | 6.37                 | 1.31             | :41                              | .0178           | .6147            |
|                                                                                                                                               |                      |                    | :58              | 2.40                 | 1.43             | 7-20-55                          |                 |                  |
|                                                                                                                                               |                      |                    | 10:00            | 1.50                 | 1.48             | 12:06a                           | .0100           | .6205            |
|                                                                                                                                               |                      |                    | :05              | 4.20                 | 1.83             | 1:11                             | .0051           | .6211            |
|                                                                                                                                               |                      |                    | :08              | 2.60                 | 1.96             | 1:41                             | .0046           | .6236            |
|                                                                                                                                               |                      |                    | :17              | 3.87                 | 2.54             | 2:36                             | .0034           | .6273            |
|                                                                                                                                               |                      |                    | :30              | .41                  | 2.61             | :50                              | .0028           | .6283            |
|                                                                                                                                               |                      |                    | :45              | .04                  | 2.62             | 5:06                             | .0001           | .6316            |
|                                                                                                                                               |                      |                    |                  |                      |                  | 6:00                             | 0               | .6316            |
| WATERSHED CONDITIONS: 55% supports desert shrubs with a cover of 23% with a grass understory of 2%. 45% grassland with a grass canopy of 20%. |                      |                    |                  |                      |                  |                                  |                 |                  |

Notes: To convert runoff in in/hr to cfs, multiply by 2238.

See 63.2-7 for isohyetal map of this event.

| SELECTED RUNOFF EVENTS                                                                                                                        |                      |                    |                  |                      |                  | Tombstone, Arizona Watershed W-3 |                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                         |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                                                          | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 14, 1958                                                                                                                      |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage 23                                                                                                                                   |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-14-58                                                                                                                                       | 0.32                 | 0                  | 8-14-58          | Raingage             | 23               | 8-14-58                          |                 |                  |
| 7-16                                                                                                                                          | .03                  | 0                  | 1:35p            | 0                    | 0                | 1:35p                            | 0               | 0                |
| 7-23                                                                                                                                          | .07                  | 0                  | :42              | 4.25                 | .50              | :42                              | .0693           | .0040            |
| 7-24                                                                                                                                          | .15                  | 0                  | :51              | 1.00                 | .65              | :45                              | .0974           | .0082            |
| 7-29                                                                                                                                          | .68                  | 0                  | 2:02             | 2.70                 | 1.15             | :50                              | .0872           | .0159            |
| 8-1                                                                                                                                           | .08                  | 0                  | :12              | .42                  | 1.22             | :53                              | .1028           | .0207            |
| 8-2                                                                                                                                           | .35                  | 0                  | :24              | .15                  | 1.25             | :59                              | .1252           | .0321            |
| 8-4                                                                                                                                           | .02                  | 0                  |                  |                      |                  | 2:02                             | .2311           | .0415            |
| 8-5                                                                                                                                           | .20                  | 0                  |                  |                      |                  | :06                              | .3174           | .0598            |
| 8-6                                                                                                                                           | .38                  | 0                  |                  |                      |                  | :14                              | .2458           | .0973            |
| 8-8                                                                                                                                           | .38                  | 0                  | 8-14-58          | Raingage             | 27               | :23                              | .1028           | .1234            |
| 8-10                                                                                                                                          | .28                  | 0                  | 1:32p            | 0                    | 0                | :30                              | .0603           | .1329            |
|                                                                                                                                               |                      |                    | :34              | 1.50                 | .05              | :38                              | .0380           | .1395            |
|                                                                                                                                               |                      |                    | :35              | 1.20                 | .07              | 3:08                             | .0168           | .1532            |
|                                                                                                                                               |                      |                    | :37              | 15.30                | .58              | :23                              | .0083           | .1564            |
| Raingage 27                                                                                                                                   |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-24-58                                                                                                                                       | 0.10                 |                    | :40              | 1.40                 | .65              | :53                              | .0031           | .1592            |
| 7-29                                                                                                                                          | .61                  |                    | :49              | 4.01                 | 1.26             | 5:01                             | 0               | .1610            |
| 8-1                                                                                                                                           | .47                  |                    | :52              | 1.00                 | 1.31             |                                  |                 |                  |
| 8-2                                                                                                                                           | .35                  |                    | :55              | 1.60                 | 1.39             |                                  |                 |                  |
| 8-5                                                                                                                                           | .20                  |                    | :56              | 3.60                 | 1.45             |                                  |                 |                  |
| 8-6                                                                                                                                           | .08                  |                    | 2:02             | .50                  | 1.50             |                                  |                 |                  |
| 8-8                                                                                                                                           | .30                  |                    | :07              | .24                  | 1.52             |                                  |                 |                  |
| 8-10                                                                                                                                          | .38                  |                    | :16              | .07                  | 1.53             |                                  |                 |                  |
| 8-11                                                                                                                                          | .06                  |                    |                  |                      |                  |                                  |                 |                  |
| Event of August 16, 1958                                                                                                                      |                      |                    |                  |                      |                  |                                  |                 |                  |
| Same as above                                                                                                                                 |                      |                    | 8-16-58          | Raingage             | 23               | 8-16-58                          |                 |                  |
|                                                                                                                                               |                      |                    | 7:00p            | 0                    | 0                | 7:03p                            | 0               | 0                |
|                                                                                                                                               |                      |                    | :04              | 7.50                 | .50              | :05                              | .0047           | .0001            |
|                                                                                                                                               |                      |                    | :08              | 2.70                 | .68              | :08                              | .0259           | .0008            |
|                                                                                                                                               |                      |                    | :14              | 4.00                 | 1.08             | :21                              | .5588           | .0642            |
|                                                                                                                                               |                      |                    | :20              | 2.70                 | 1.35             | :23                              | .3978           | .0801            |
|                                                                                                                                               |                      |                    | :26              | 2.40                 | 1.59             | :25                              | .2458           | .0908            |
|                                                                                                                                               |                      |                    | :36              | .60                  | 1.69             | 8:07                             | .0259           | .1859            |
|                                                                                                                                               |                      |                    | :49              | .18                  | 1.73             | 9:00                             | .0170           | .2049            |
|                                                                                                                                               |                      |                    | 8:33             | .02                  | 1.75             | 10:00                            | .0076           | .2172            |
|                                                                                                                                               |                      |                    | :48              | .24                  | 1.81             | 11:00                            | .0045           | .2233            |
|                                                                                                                                               |                      |                    | 9:22             | .04                  | 1.83             | 12:00m                           | .0022           | .2267            |
|                                                                                                                                               |                      |                    |                  |                      |                  | 8-17-58                          |                 |                  |
|                                                                                                                                               |                      |                    |                  |                      |                  | 1:30a                            | 0               | .2283            |
|                                                                                                                                               |                      |                    | 8-16-58          | Raingage             | 27               |                                  |                 |                  |
|                                                                                                                                               |                      |                    | 6:50p            | 0                    | 0                |                                  |                 |                  |
|                                                                                                                                               |                      |                    | 7:00             | 1.92                 | .32              |                                  |                 |                  |
|                                                                                                                                               |                      |                    | :10              | 4.56                 | 1.08             |                                  |                 |                  |
|                                                                                                                                               |                      |                    | :20              | 1.02                 | 1.25             |                                  |                 |                  |
|                                                                                                                                               |                      |                    | :30              | .12                  | 1.27             |                                  |                 |                  |
|                                                                                                                                               |                      |                    | 8:20             | 0                    | 1.27             |                                  |                 |                  |
|                                                                                                                                               |                      |                    | :38              | .17                  | 1.32             |                                  |                 |                  |
|                                                                                                                                               |                      |                    | 9:10             | .04                  | 1.34             |                                  |                 |                  |
|                                                                                                                                               |                      |                    | :20              | .36                  | 1.40             |                                  |                 |                  |
| WATERSHED CONDITIONS: 55% supports desert shrubs with a cover of 23% with a grass understory of 2%. 45% grassland with a grass canopy of 20%. |                      |                    |                  |                      |                  |                                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 2238.<br>See 03.1-7 for isohyetal maps of these events.                                 |                      |                    |                  |                      |                  |                                  |                 |                  |



LORESTONE, ARIZONA Watershed W-2



## TOMBSTONE, ARIZONA Watershed W-4

LOCATION: Cochise County; 3 miles north of Tombstone; tributary of Walnut Gulch; tributary of San Pedro River.

AREA: 0.88 sq. mi. (560 ac.) SHAPE: Oval, 1½ miles long by ½ mile wide.

SLOPES: Not available

Aspect SW

SOILS: Tombstone 100%, a gravelly loam, calcareous throughout, with a moderately permeable surface and subsoil.

EROSION: 2 - 100%.

LAND CAPABILITY: VI - 100%.

SURFACE DRAINAGE: Good; length of principal drainage 2 miles.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff - critical depth flume, recorder with 8 hr. chart; Precipitation - 3 recording raingages.

WATERSHED CONDITIONS: Shrub cover of 25%.

GENERALLY REPRESENTS: Desert grassland ranges in the Southeastern Arizona Basin and Range resource area (D-41).

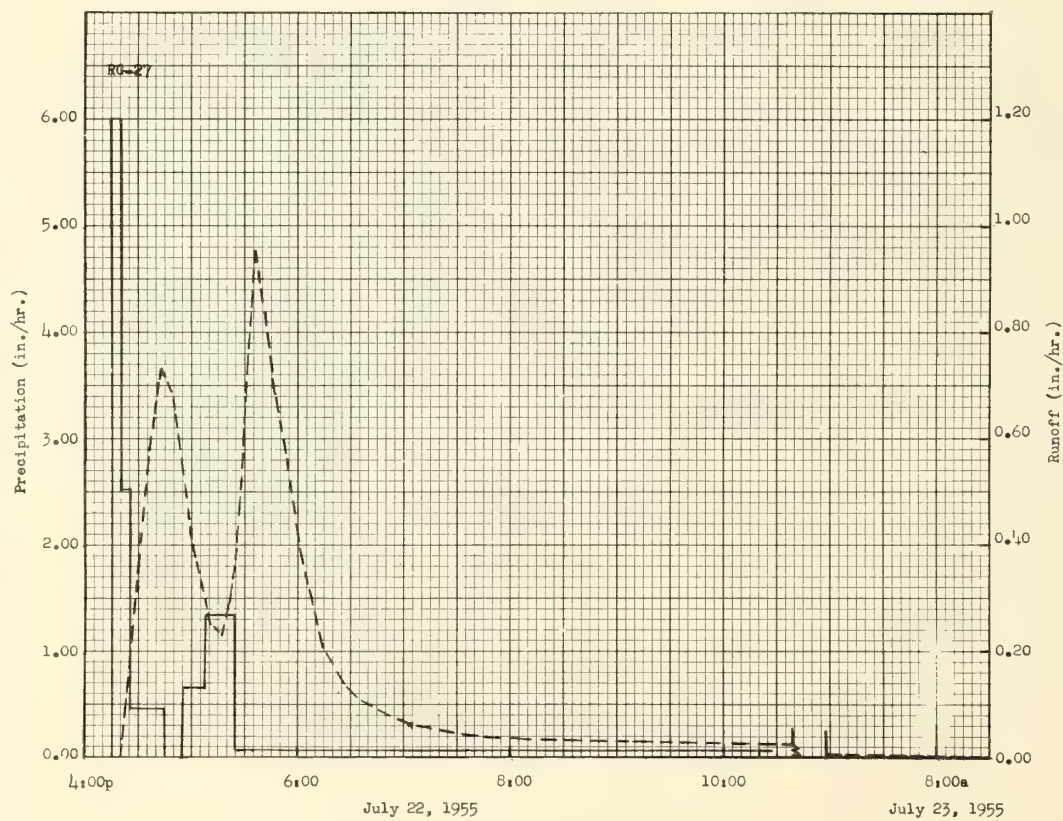
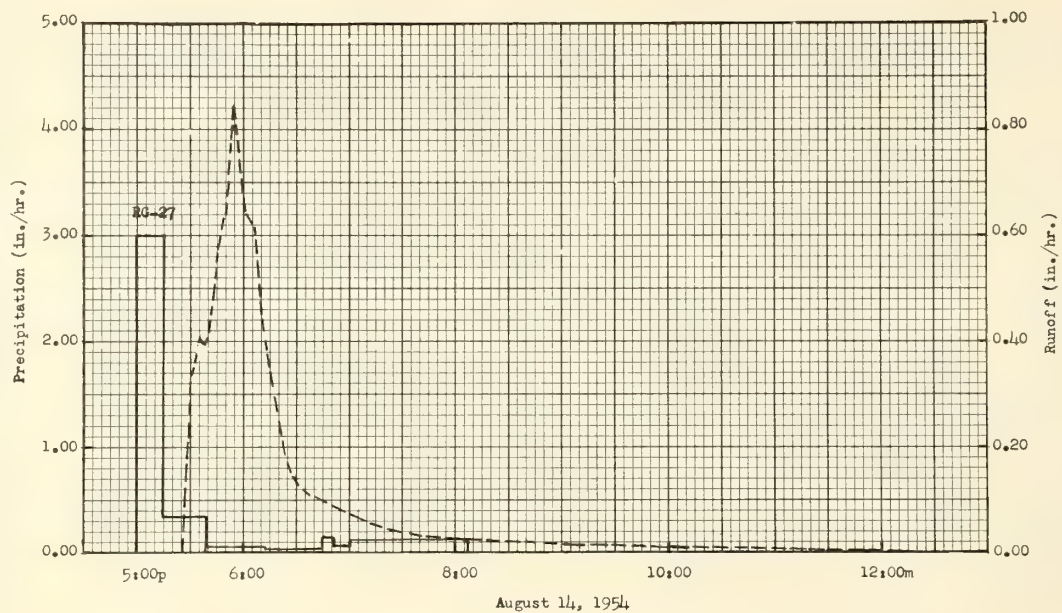
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                               |                   |        |                                           |        |         |        |         | Tombstone, Arizona Watershed W-4 |          |        |       |        |        |        |        |        |
|-------------------------------------------------------------------------------------------------------------------------|-------------------|--------|-------------------------------------------|--------|---------|--------|---------|----------------------------------|----------|--------|-------|--------|--------|--------|--------|--------|
| Month<br>Year                                                                                                           | Jan.              | Feb.   | Mar.                                      | Apr.   | May     | June   | July    | Aug.                             | Sept.    | Oct.   | Nov.  | Dec.   | Year   |        |        |        |
| 1954 P                                                                                                                  |                   |        |                                           |        |         | NR     | NR      | 4.29                             | 0.63     | 0.15   | 0     | 0      | Inc.   |        |        |        |
| Q                                                                                                                       |                   |        |                                           |        |         | 0      | .05     | 1.38                             | 0        | 0      | 0     | 0      | 1.43   |        |        |        |
| 1955 P                                                                                                                  | 0.79              | 0.10   | 0.41                                      | 0      | 0       | 0.43   | 11.30   | 3.78                             | .46      | .12    | 0     | .20    | 17.59  |        |        |        |
| Q                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | 0      | 5.60    | .43                              | 0        | 0      | 0     | 0      | 6.03   |        |        |        |
| 1956 P                                                                                                                  | .56               | .18    | 0                                         | .23    | 0       | .40    | 4.66    | 1.34                             | 0        | .28    | .06   | .10    | 7.81   |        |        |        |
| Q                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | 0      | .08     | .05                              | 0        | 0      | 0     | 0      | .13    |        |        |        |
| 1957 P                                                                                                                  | 1.24              | .10    | 1.14                                      | .03    | .34     | .42    | 1.82    | 4.16                             | 0        | 1.14   | .15   | .29    | 10.83  |        |        |        |
| Q                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | 0      | 0       | .15                              | 0        | 0      | 0     | 0      | .15    |        |        |        |
| 1958 P                                                                                                                  | 0                 | 1.13   | 1.71                                      | .90    | .02     | .26    | 1.01    | 6.24                             | 1.60     | .82    | .30   | 0      | 13.99  |        |        |        |
| Q                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | 0      | 0       | .36                              | 0        | 0      | 0     | 0      | .36    |        |        |        |
| 1959 P                                                                                                                  | 0                 | .48    | 0                                         | .04    | 0       | .83    | 3.68    | 3.35                             | .53      | .80    | 1.08  | .84    | 11.63  |        |        |        |
| Q                                                                                                                       | 0                 | 0      | 0                                         | 0      | 0       | 0      | .01     | .03                              | 0        | 0      | 0     | 0      | .04    |        |        |        |
| Normal P                                                                                                                | .86               | .82    | .61                                       | .29    | .20     | .51    | 3.68    | 3.50                             | 1.53     | .64    | .63   | .87    | 14.14  |        |        |        |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS |                   |        |                                           |        |         |        |         | Tombstone, Arizona Watershed W-4 |          |        |       |        |        |        |        |        |
| YEAR                                                                                                                    | MAXIMUM DISCHARGE |        | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
|                                                                                                                         |                   |        | 1 hour                                    |        | 2 hours |        | 6 hours |                                  | 12 hours |        | 1 day |        | 2 days |        | 8 days |        |
|                                                                                                                         | Date              | Rate   | Date                                      | Vol.   | Date    | Vol.   | Date    | Vol.                             | Date     | Vol.   | Date  | Vol.   | Date   | Vol.   | Date   | Vol.   |
| 1954                                                                                                                    | 8-19              | 0.9317 | 8-14                                      | 0.4849 | 8-14    | 0.5705 | 8-14    | 0.6476                           | 8-14     | 0.6476 | 8-14  | 0.6476 | 8-14   | 0.6476 | 8-14   | 1.1942 |
| 1955                                                                                                                    | 7-19              | 2.5194 | 7-19                                      | 1.0655 | 7-19    | 1.2328 | 7-19    | 1.2911                           | 7-19     | 1.2911 | 7-19  | 1.9365 | 7-19   | 1.9371 | 7-19   | 4.7818 |
| 1956                                                                                                                    | 7-19              | .1321  | 7-19                                      | .0352  | 8-17    | .0507  | 8-17    | .0507                            | 8-17     | .0507  | 8-17  | .0507  | 8-17   | .0507  | 8-14   | .0510  |
| 1957                                                                                                                    | 8-17              | .1962  | 8-17                                      | .1322  | 8-17    | .1439  | 8-17    | .1439                            | 8-17     | .1439  | 8-17  | .1439  | 8-17   | .1439  | 8-17   | .1493  |
| 1958                                                                                                                    | 8-16              | .3147  | 8-16                                      | .1484  | 8-16    | .1558  | 8-16    | .1561                            | 8-16     | .1561  | 8-16  | .1561  | 8-16   | .1561  | 8-16   | .2386  |
| 1959                                                                                                                    | 8-17              | .0548  | 8-17                                      | .0142  | 8-17    | .0160  | 8-17    | .0160                            | 8-17     | .0160  | 8-17  | .0160  | 8-17   | .0160  | 8-13   | .0300  |
| Notes: Quality of record: P, poor in 1954 and 1955; fair, 1956 through 1959. Q, good, 1954 through 1958; poor in 1959   |                   |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
| Monthly P is arithmetic average of raingages                                                                            |                   |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
| Normal P based on 60 years record (1897-1957), USWB Station, Tombstone, Arizona.                                        |                   |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |

| SELECTED RUNOFF EVENTS                                     |                      |                    |                  |                      |                  | Tombstone, Arizona Watershed W-4 |                 |                  |
|------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                      |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                       | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 14, 1954                                   |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage 27                                                |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-22-54                                                    | 0.95                 | 0.05               | 8-14-54          | Raingage 27          |                  | 8-14-54                          |                 |                  |
| 7-31                                                       | .73                  | 0                  | 5:05p            | 0                    | 0                | 5:14p                            | 0               | 0                |
| 8-2                                                        | .32                  | 0                  | :15              | 3.00                 | 0.50             | :18                              | 0.0001          | 0                |
| 8-3                                                        | .40                  | 0                  | :37              | .33                  | .62              | :23                              | .0006           | 0                |
| 8-4                                                        | .99                  | 0                  | 6:12             | .07                  | .65              | :25                              | .0039           | 0.0001           |
| 8-5                                                        | .02                  | .03                | :45              | .04                  | .67              | :30                              | .3310           | .0141            |
| 8-6                                                        | .11                  | 0                  | :49              | .15                  | .68              | :35                              | .4124           | .0451            |
| 8-8                                                        | .05                  | .13                | 7:00             | .07                  | .69              | :37                              | .3912           | .0585            |
| 8-9                                                        | .18                  | .02                | 8:08             | .11                  | .82              | :40                              | .4283           | .0790            |
| 8-11                                                       | .16                  | 0                  |                  |                      |                  | :45                              | .5770           | .1209            |
| 8-12                                                       | .27                  | .01                |                  |                      |                  | :50                              | .6655           | .1727            |
| WATERSHED CONDITIONS: Shrub cover<br>of 25%.               |                      |                    |                  |                      |                  | :54                              | .8443           | .2230            |
|                                                            |                      |                    |                  |                      |                  | 6:00                             | .6496           | .2977            |
|                                                            |                      |                    |                  |                      |                  | :05                              | .6213           | .3507            |
|                                                            |                      |                    |                  |                      |                  | :10                              | .4496           | .3953            |
|                                                            |                      |                    |                  |                      |                  | :15                              | .3416           | .4283            |
|                                                            |                      |                    |                  |                      |                  | :20                              | .2496           | .4529            |
|                                                            |                      |                    |                  |                      |                  | :25                              | .1621           | .4700            |
|                                                            |                      |                    |                  |                      |                  | :30                              | .1322           | .4822            |
|                                                            |                      |                    |                  |                      |                  | :40                              | .1025           | .5018            |
|                                                            |                      |                    |                  |                      |                  | :50                              | .0913           | .5180            |
|                                                            |                      |                    |                  |                      |                  | 7:00                             | .0731           | .5317            |
|                                                            |                      |                    |                  |                      |                  | :15                              | .0512           | .5473            |
|                                                            |                      |                    |                  |                      |                  | :45                              | .0319           | .5681            |
|                                                            |                      |                    |                  |                      |                  | 8:15                             | .0264           | .5827            |
|                                                            |                      |                    |                  |                      |                  | :45                              | .0210           | .5947            |
|                                                            |                      |                    |                  |                      |                  | 9:15                             | .0189           | .6048            |
|                                                            |                      |                    |                  |                      |                  | 10:15                            | .0142           | .6214            |
|                                                            |                      |                    |                  |                      |                  | 11:45                            | .0088           | .6391            |
|                                                            |                      |                    |                  |                      |                  | 8-15-54                          |                 |                  |
|                                                            |                      |                    |                  |                      |                  | 12:45a                           | .0027           | .6445            |
|                                                            |                      |                    |                  |                      |                  | 1:45                             | 0               | .6459            |
| Event of July 19, 1955                                     |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage 27                                                |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-11-55                                                    | 0.65                 | 0                  | 7-19-55          | Raingage 27          |                  | 7-19-55                          |                 |                  |
| 7-12                                                       | .01                  | 0                  | 9:08p            | 0                    | 0                | 9:22p                            | 0               | 0                |
| 7-14                                                       | .21                  | 0                  | :20              | 1.30                 | 0.26             | :28                              | 0.0009          | 0                |
| 7-15                                                       | .26                  | 0                  | :25              | 2.64                 | .48              | :35                              | .2044           | 0.0120           |
| 7-16                                                       | .06                  | 0                  | :33              | 1.05                 | .62              | :45                              | .2384           | .0485            |
| 7-17                                                       | .05                  | 0                  | :50              | .56                  | .78              | :55                              | .3915           | .1014            |
| 7-18                                                       | .04                  | 0                  | :55              | 6.37                 | 1.31             | 10:00                            | .5742           | .1416            |
|                                                            |                      |                    | :58              | 2.40                 | 1.43             | :05                              | 1.5051          | .2282            |
|                                                            |                      |                    | 10:00            | 1.50                 | 1.48             | :10                              | 1.4581          | .3511            |
|                                                            |                      |                    | :05              | 4.20                 | 1.83             | :15                              | 2.4795          | .5158            |
|                                                            |                      |                    | :08              | 2.60                 | 1.96             | :20                              | 2.1263          | .7077            |
|                                                            |                      |                    | :17              | 3.87                 | 2.54             | :25                              | 1.4581          | .8570            |
|                                                            |                      |                    | :30              | .41                  | 2.61             | :30                              | .9361           | .9568            |
|                                                            |                      |                    | :45              | .04                  | 2.62             | :40                              | .4420           | 1.0716           |
| WATERSHED CONDITIONS: Shrub cover<br>of 25%.               |                      |                    |                  |                      |                  | :50                              | .2854           | 1.1322           |
|                                                            |                      |                    |                  |                      |                  | 11:00                            | .1823           | 1.1712           |
|                                                            |                      |                    |                  |                      |                  | :20                              | .0885           | 1.2163           |
|                                                            |                      |                    |                  |                      |                  | 12:00m                           | .0513           | 1.2629           |
|                                                            |                      |                    |                  |                      |                  | 7-20-55                          |                 |                  |
|                                                            |                      |                    |                  |                      |                  | 1:00a                            | .0248           | 1.3010           |
|                                                            |                      |                    |                  |                      |                  | 2:00                             | .0053           | 1.3161           |
|                                                            |                      |                    |                  |                      |                  | 3:00                             | 0               | 1.3187           |
|                                                            |                      |                    |                  |                      |                  |                                  |                 |                  |
|                                                            |                      |                    |                  |                      |                  |                                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 565. |                      |                    |                  |                      |                  |                                  |                 |                  |
| See 63.2-7 for isohyetal map of event for July 19, 1955.   |                      |                    |                  |                      |                  |                                  |                 |                  |

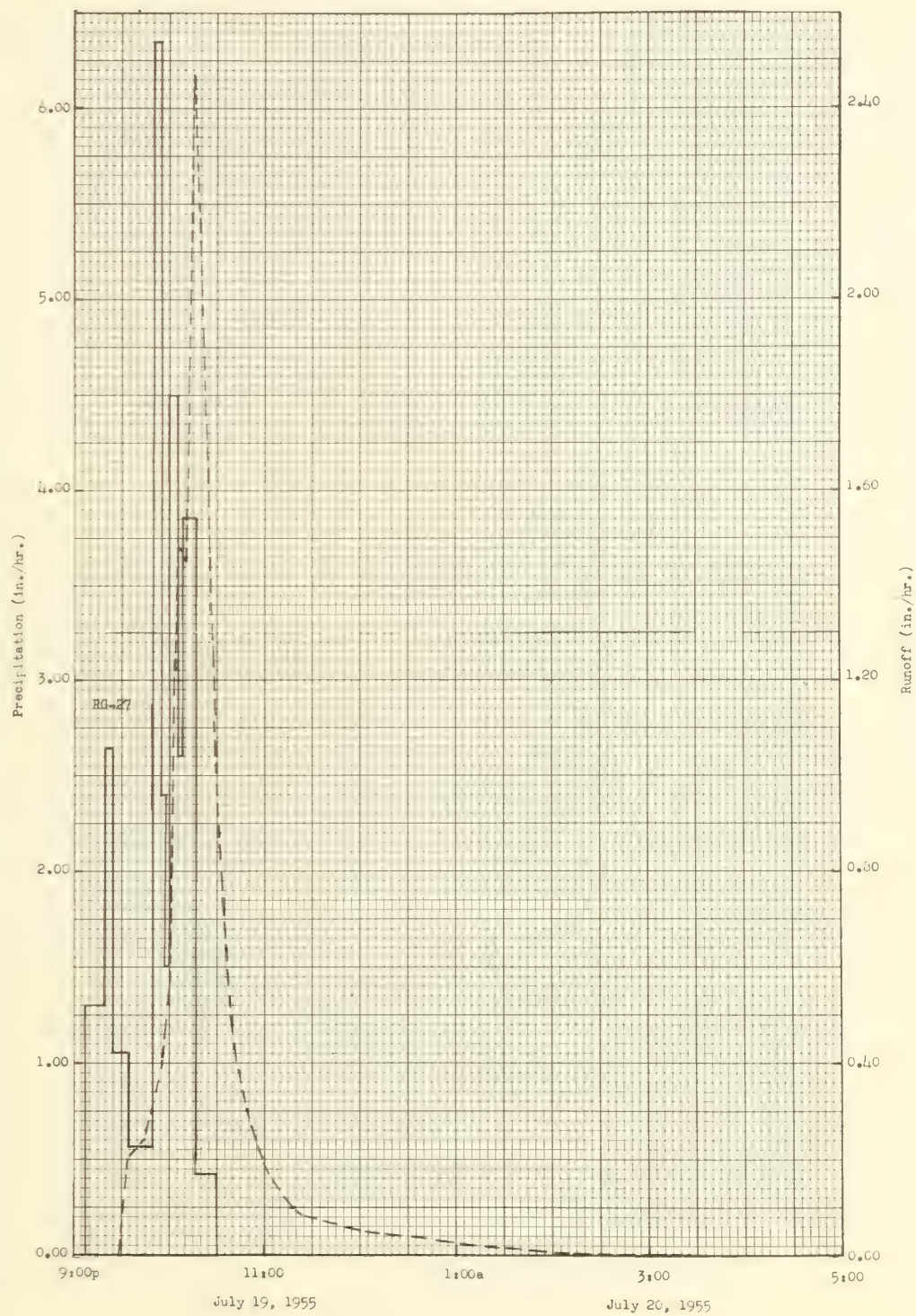
| SELECTED RUNOFF EVENTS                                     |                      |                    |                  |                      |                  | Tombstone, Arizona Watershed W-4 |                 |                  |
|------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                      |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                       | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 22, 1955                                     |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage 27                                                |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-11-55                                                    | 0.65                 | 0                  | 7-22-55          | Raingage 27          |                  | 7-22-55                          |                 |                  |
| 7-12                                                       | .01                  | 0                  | 4:15p            | 0                    | 0                | 4:10p                            | 0               | 0                |
| 7-14                                                       | .21                  | 0                  | :20              | 6.00                 | 0.50             | :20                              | 0.0033          | 0.0003           |
| 7-15                                                       | .26                  | 0                  | :25              | 2.52                 | .71              | :25                              | .2053           | .0090            |
| 7-16                                                       | .06                  | 0                  | :45              | .48                  | .87              | :30                              | .3522           | .0322            |
| 7-17                                                       | .05                  | 0                  | :55              | .06                  | .88              | :35                              | .5275           | .0688            |
| 7-18                                                       | .04                  | 0                  | 5:06             | .65                  | 1.00             | :40                              | .6726           | .1188            |
| 7-19                                                       | 2.62                 | 1.29               | :23              | 1.31                 | 1.37             | :43                              | .7328           | .1539            |
| 7-20                                                       | 1.29                 | .65                | 10:20            | .09                  | 1.83             | :48                              | .6867           | .2130            |
|                                                            |                      |                    |                  |                      |                  | :55                              | .5398           | .2846            |
|                                                            |                      |                    |                  |                      |                  | 5:00                             | .3982           | .3237            |
|                                                            |                      |                    |                  |                      |                  | :05                              | .3487           | .3548            |
|                                                            |                      |                    |                  |                      |                  | :10                              | .2496           | .3797            |
|                                                            |                      |                    |                  |                      |                  | :16                              | .2301           | .4037            |
|                                                            |                      |                    |                  |                      |                  | :20                              | .2655           | .4202            |
|                                                            |                      |                    |                  |                      |                  | :25                              | .3823           | .4472            |
|                                                            |                      |                    |                  |                      |                  | :30                              | .6337           | .4895            |
|                                                            |                      |                    |                  |                      |                  | :36                              | .9523           | .5688            |
|                                                            |                      |                    |                  |                      |                  | :40                              | .8531           | .6290            |
|                                                            |                      |                    |                  |                      |                  | :45                              | .7151           | .6943            |
|                                                            |                      |                    |                  |                      |                  | :50                              | .6337           | .7505            |
|                                                            |                      |                    |                  |                      |                  | 6:00                             | .3947           | .8362            |
|                                                            |                      |                    |                  |                      |                  | :15                              | .1947           | .9099            |
|                                                            |                      |                    |                  |                      |                  | :25                              | .1322           | .9371            |
|                                                            |                      |                    |                  |                      |                  | :35                              | .1035           | .9567            |
|                                                            |                      |                    |                  |                      |                  | 7:00                             | .0637           | .9915            |
|                                                            |                      |                    |                  |                      |                  | :30                              | .0451           | 1.0187           |
|                                                            |                      |                    |                  |                      |                  | 8:00                             | .0356           | 1.0389           |
|                                                            |                      |                    |                  |                      |                  | 9:00                             | .0246           | 1.0690           |
|                                                            |                      |                    |                  |                      |                  | 12:00m                           | .0193           | 1.1350           |
|                                                            |                      |                    |                  |                      |                  | 7-23-55                          |                 |                  |
|                                                            |                      |                    |                  |                      |                  | 3:00a                            | .0089           | 1.1773           |
|                                                            |                      |                    |                  |                      |                  | 8:00                             | 0               | 1.1993           |
| WATERSHED CONDITIONS: Shrub cover of 25%.                  |                      |                    |                  |                      |                  |                                  |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 565. |                      |                    |                  |                      |                  |                                  |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                 |                      |                    |                  |                      |                  | Tombstone, Arizona Watershed W-4 |                 |                  |
|--------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                  |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                   | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 14, 1958                                                                               |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage 27                                                                                            |                      |                    |                  |                      |                  |                                  |                 |                  |
| 7-4-58                                                                                                 | 0.18                 | 0                  | 8-14-58          | Raingage             | 27               | 8-14-58                          |                 |                  |
| 7-24                                                                                                   | .10                  | 0                  | 1:32p            |                      | 0                | 1:44p                            | 0               | 0                |
| 7-29                                                                                                   | .61                  | 0                  | :34              | 1.50                 | .05              | :48                              | .0100           | .0003            |
| 8-1                                                                                                    | .47                  | 0                  | :35              | 1.20                 | .07              | :55                              | .0802           | .0056            |
| 8-2                                                                                                    | .35                  | 0                  | :37              | 15.30                | .58              | :59                              | .2301           | .0159            |
| 8-5                                                                                                    | .20                  | 0                  | 1:40             | 1.40                 | .65              | 2:33                             | .0216           | .0851            |
| 8-6                                                                                                    | .08                  | 0                  | :49              | 4.01                 | 1.26             | :52                              | .0062           | .0895            |
| 8-8                                                                                                    | .30                  | 0                  | :52              | 1.00                 | 1.31             | 3:05                             | .0033           | .0905            |
| 8-10                                                                                                   | .38                  | 0                  | :55              | 1.60                 | 1.39             | :31                              | .0011           | .0915            |
| 8-11                                                                                                   | .06                  | 0                  | :56              | 3.60                 | 1.45             | 4:01                             | .0002           | .0918            |
| Raingage 31                                                                                            |                      |                    | 2:02             | .50                  | 1.50             | 4:46                             | 0               | .0919            |
| 7-5-58                                                                                                 | 0.06                 | 0                  | :07              | .24                  | 1.52             |                                  |                 |                  |
| 7-19                                                                                                   | .13                  | 0                  | :16              | .07                  | 1.53             |                                  |                 |                  |
| 7-24                                                                                                   | .15                  | 0                  |                  |                      |                  |                                  |                 |                  |
| 7-29                                                                                                   | .79                  | 0                  | 8-14-58          | Raingage             | 31               |                                  |                 |                  |
| 8-1                                                                                                    | .13                  | 0                  | 1:07p            |                      | 0                |                                  |                 |                  |
| 8-2                                                                                                    | .27                  | 0                  | :17              | 1.32                 | .22              |                                  |                 |                  |
| 8-5                                                                                                    | .47                  | 0                  | :37              | .66                  | .44              |                                  |                 |                  |
| 8-6                                                                                                    | .06                  | 0                  | :52              | .02                  | .45              |                                  |                 |                  |
| 8-8                                                                                                    | .41                  | 0                  |                  |                      |                  |                                  |                 |                  |
| 8-10                                                                                                   | .70                  |                    |                  |                      |                  |                                  |                 |                  |
| WATERSHED CONDITIONS: Shrub cover of 25%.                                                              |                      |                    |                  |                      |                  |                                  |                 |                  |
| Event of August 16, 1958                                                                               |                      |                    |                  |                      |                  |                                  |                 |                  |
| Same as above                                                                                          |                      |                    | 8-16-58          | Raingage             | 27               | 8-16-58                          |                 |                  |
|                                                                                                        |                      |                    | 5:50p            | 0                    | 0                | 7:18p                            | 0               | 0                |
|                                                                                                        |                      |                    | 7:00             | 1.92                 | .32              | :21                              | .2212           | .0055            |
|                                                                                                        |                      |                    | :10              | 4.56                 | 1.08             | :26                              | .3151           | .0279            |
|                                                                                                        |                      |                    | :20              | 1.02                 | 1.25             | :33                              | .2744           | .0624            |
|                                                                                                        |                      |                    | 7:30             | .12                  | 1.27             | :38                              | .3080           | .0867            |
|                                                                                                        |                      |                    | 8:20             |                      | 1.27             | :53                              | .0943           | .1370            |
|                                                                                                        |                      |                    | :38              | .17                  | 1.32             | 8:00                             | .0326           | .1444            |
|                                                                                                        |                      |                    | 9:10             | .04                  | 1.34             | :07                              | .0258           | .1478            |
|                                                                                                        |                      |                    | :20              | .36                  | 1.40             | :17                              | .0165           | .1513            |
|                                                                                                        |                      |                    | 8-16-58          | Raingage             | 31               | :20                              | .0169           | .1521            |
|                                                                                                        |                      |                    | 7:02             | 0                    | 0                | :47                              | .0069           | .1575            |
|                                                                                                        |                      |                    | :10              | 1.58                 | .21              | 9:00                             | .0046           | .1588            |
|                                                                                                        |                      |                    | :15              | 9.46                 | 1.00             | :14                              | .0025           | .1596            |
|                                                                                                        |                      |                    | :25              | .30                  | 1.05             | :45                              | .0008           | .1608            |
|                                                                                                        |                      |                    |                  |                      |                  | 10:30                            | .0002           | .1612            |
|                                                                                                        |                      |                    |                  |                      |                  | 11:00                            | 0               | .1612            |
| Notes: To convert runoff in in/hr to cfs, multiply by 565.<br>See 63.1-7 for isohyetal maps of events. |                      |                    |                  |                      |                  |                                  |                 |                  |



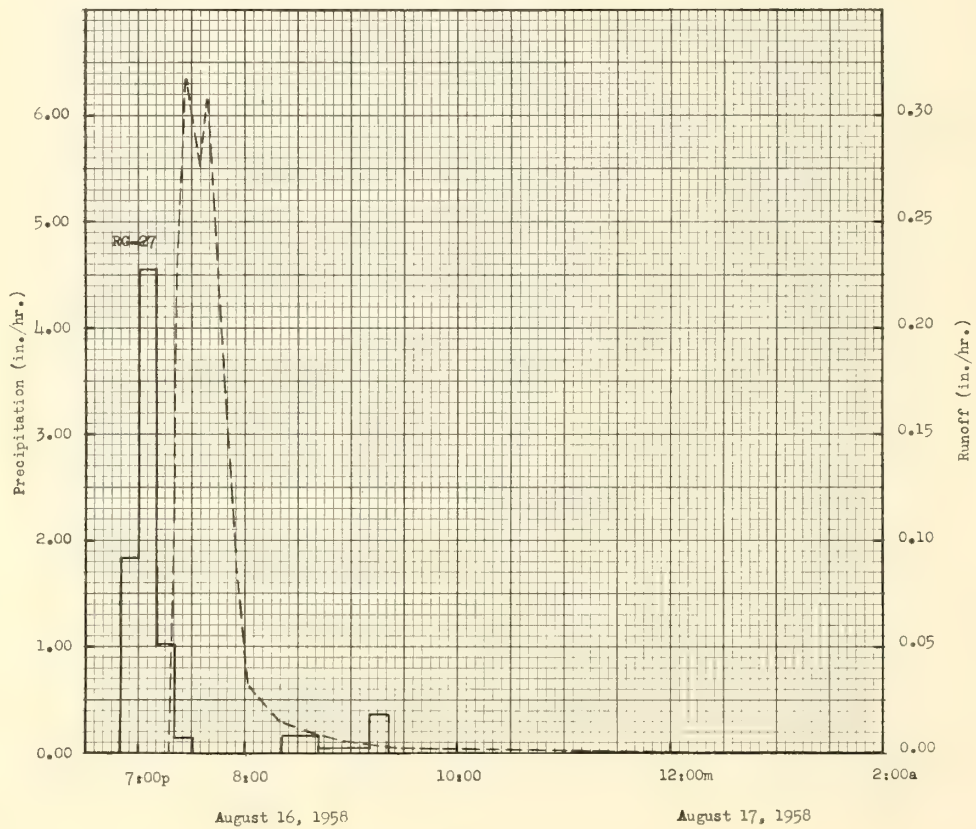
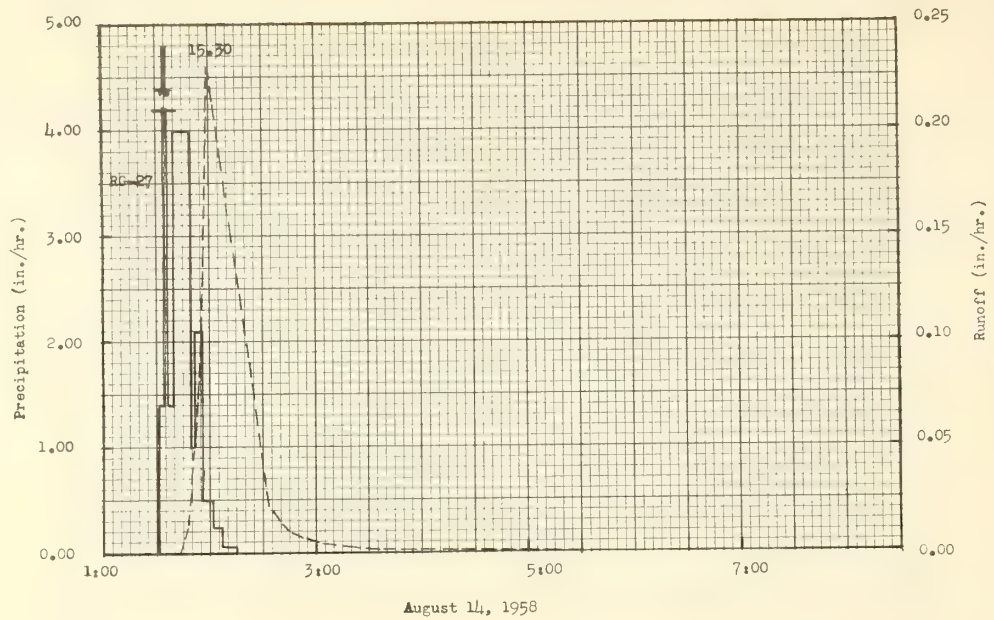


TOMBSTONE, ARIZONA Watershed N-4

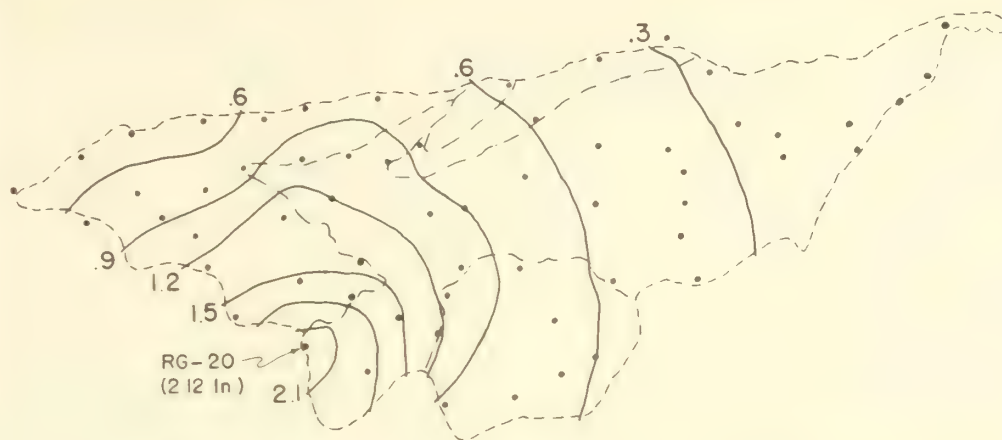


TOMBSTONE, ARIZONA Watershed W-14



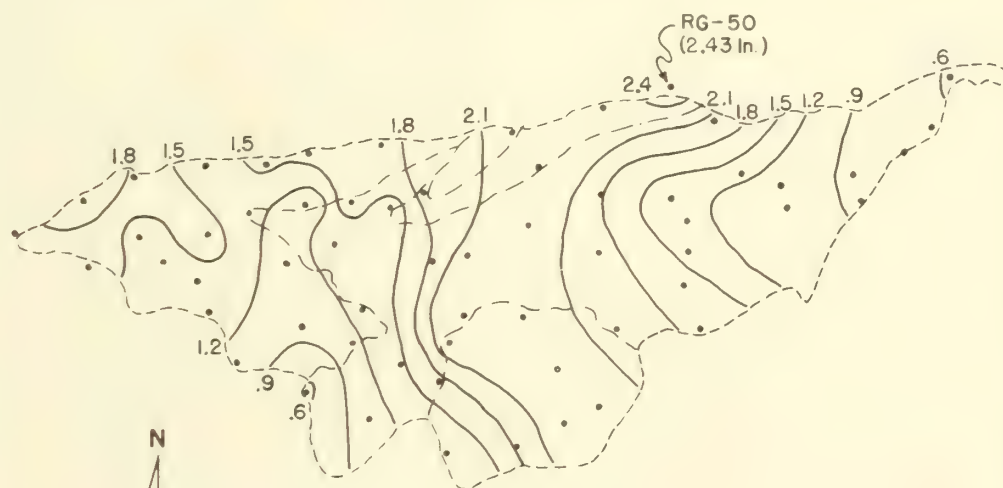


TOMBSTONE, ARIZONA Watershed W-4



**WALNUT GULCH WATERSHED**  
**Isohyetal Map**

STORM OF AUGUST 14, 1954



**WALNUT GULCH WATERSHED**  
**Isohyetal Map**

STORM OF JULY 22, 1955



## TOMBSTONE, ARIZONA Watershed W-5

**LOCATION:** Cochise County; 2 miles east of Tombstone; Walnut Gulch, tributary of San Pedro River.

**AREA:** 8.01 sq. mi. (5510 ac.) **SHAPE:** Roughly circular, diameter of  $3\frac{1}{2}$  miles.

**SLOPES:** Not available

Aspect NNW

**SOILS:** Boothill, a stony clay loam developed on andesite extrusions; calcareous throughout the profile; moderately permeable -- 15%. Cave, a gravelly sandy loam developed on outwash material from andesite extrusions; calcareous throughout the profile; moderately permeable -- 15%. Tombstone (see description under W-2) 43%. Tortugas (see W-2) 8%. The remaining 19% is made up of small bodies of five other moderately permeable soils.

**EROSION:** 1 - 20%; 2 - 80%.

**LAND CAPABILITY:** V 30%; VI 70%.

**SURFACE DRAINAGE:** Good; length of principal drainage - 3 miles.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff - critical depth flume, recorder with 8 hr. chart; Precipitation - 10 recording raingages, 2 standard gages.

**WATERSHED CONDITIONS:** Desert shrubs (whitethorn, tarbush, creosotebush) cover 25%. Grassland, grass canopy 22%.

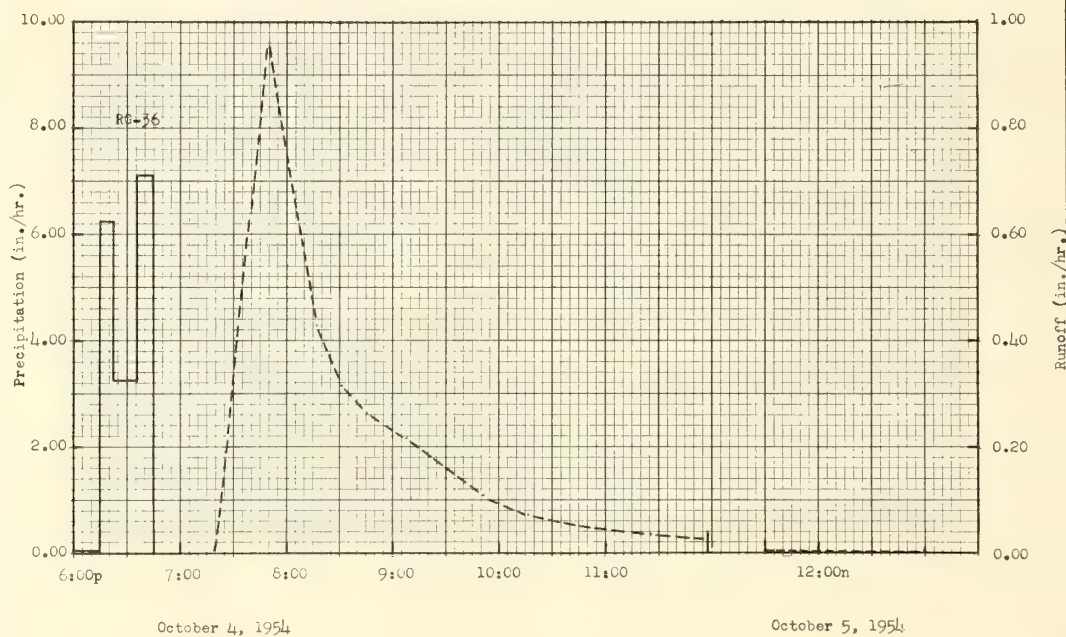
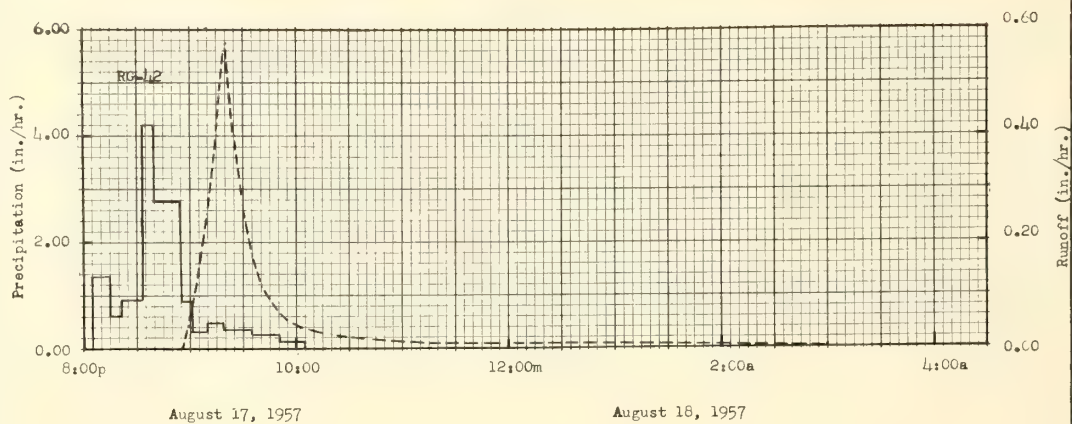
**GENERALLY REPRESENTS:** Desert grassland ranges in the Southeastern Arizona Basin and Range resource area (D-41).

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                     |                   |        |                                           |        |         |        |         | Tombstone, Arizona Watershed W-5 |          |        |       |        |        |        |        |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------|-------------------------------------------|--------|---------|--------|---------|----------------------------------|----------|--------|-------|--------|--------|--------|--------|--------|
| Month                                                                                                                                                                                                                                         |                   | Jan.   | Feb.                                      | Mar.   | Apr.    | May    | June    | July                             | Aug.     | Sept.  | Oct.  | Nov.   | Dec.   | Year   |        |        |
| Year                                                                                                                                                                                                                                          |                   |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
| 1954                                                                                                                                                                                                                                          | P                 | 0.58   | 0.20                                      | 0.37   | 0       | 0.56   | 0.78    | 2.26                             | 5.06     | 0.52   | 1.93  | 0      | 0      | 12.26  |        |        |
|                                                                                                                                                                                                                                               | Q                 | 0      | 0                                         | 0      | 0       | 0      | 0       | .01                              | .24      | .01    | 1.05  | 0      | 0      | 1.31   |        |        |
| 1955                                                                                                                                                                                                                                          | P                 | 1.18   | .31                                       | .42    | 0       | .04    | .15     | 6.97                             | 4.32     | .14    | .16   | .07    | .39    | 14.15  |        |        |
|                                                                                                                                                                                                                                               | Q                 | 0      | 0                                         | 0      | 0       | 0      | 0       | .33                              | .32      | 0      | 0     | 0      | 0      | .65    |        |        |
| 1956                                                                                                                                                                                                                                          | P                 | .68    | .33                                       | 0      | .19     | 0      | .69     | 3.75                             | .59      | .06    | .13   | .01    | .15    | 6.58   |        |        |
|                                                                                                                                                                                                                                               | Q                 | 0      | 0                                         | 0      | 0       | 0      | 0       | .13                              | 0        | 0      | 0     | 0      | 0      | .13    |        |        |
| 1957                                                                                                                                                                                                                                          | P                 | 1.86   | .08                                       | 1.45   | .09     | .21    | .34     | 2.72                             | 6.16     | 0      | 1.59  | .08    | .30    | 14.88  |        |        |
|                                                                                                                                                                                                                                               | Q                 | 0      | 0                                         | 0      | 0       | 0      | 0       | .02                              | .52      | 0      | 0     | 0      | 0      | .54    |        |        |
| 1958                                                                                                                                                                                                                                          | P                 | 0      | 1.20                                      | 2.20   | .71     | .01    | .21     | 1.41                             | 5.43     | 2.18   | .88   | .49    | 0      | 14.72  |        |        |
|                                                                                                                                                                                                                                               | Q                 | 0      | 0                                         | 0      | 0       | 0      | 0       | 0                                | .43      | 0      | 0     | 0      | 0      | .43    |        |        |
| 1959                                                                                                                                                                                                                                          | P                 | 0      | .40                                       | 0      | .03     | 0      | 1.03    | 6.10                             | 3.66     | .38    | 1.35  | .92    | .92    | 14.79  |        |        |
|                                                                                                                                                                                                                                               | Q                 | 0      | 0                                         | 0      | 0       | 0      | 0       | .27                              | .12      | 0      | 0     | 0      | 0      | .39    |        |        |
| Normal                                                                                                                                                                                                                                        | P                 | .86    | .82                                       | .61    | .29     | .20    | .51     | 3.68                             | 3.50     | 1.53   | .64   | .63    | .87    | 14.14  |        |        |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                       |                   |        |                                           |        |         |        |         | Tombstone, Arizona Watershed W-5 |          |        |       |        |        |        |        |        |
| YEAR                                                                                                                                                                                                                                          | MAXIMUM DISCHARGE |        | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |        |         |        |         |                                  |          |        |       |        |        |        |        |        |
|                                                                                                                                                                                                                                               |                   |        | 1 hour                                    |        | 2 hours |        | 6 hours |                                  | 12 hours |        | 1 day |        | 2 days |        | 8 days |        |
|                                                                                                                                                                                                                                               | Date              | Rate   | Date                                      | Vol.   | Date    | Vol.   | Date    | Vol.                             | Date     | Vol.   | Date  | Vol.   | Date   | Vol.   | Date   | Vol.   |
| 1954                                                                                                                                                                                                                                          | 10-4              | 0.9540 | 10-4                                      | 0.6245 | 10-4    | 0.8354 | 10-4    | 1.0512                           | 10-4     | 1.0516 | 10-4  | 1.0516 | 10-4   | 1.0516 | 10-4   | 1.0516 |
| 1955                                                                                                                                                                                                                                          | 7-25              | .3960  | 7-25                                      | .1429  | 7-25    | .2022  | 7-25    | .2500                            | 7-25     | .2500  | 7-25  | .2522  | 7-25   | .2522  | 7-22   | .3281  |
| 1956                                                                                                                                                                                                                                          | 7-18              | .1026  | 7-18                                      | .0720  | 7-18    | .0935  | 7-18    | .1011                            | 7-18     | .1011  | 7-18  | .1011  | 7-17   | .1017  | 7-15   | .1028  |
| 1957                                                                                                                                                                                                                                          | 8-17              | .5652  | 8-17                                      | .2158  | 8-17    | .2300  | 8-17    | .2396                            | 8-17     | .2396  | 8-17  | .2396  | 8-17   | .2396  | 8-17   | .2466  |
| 1958                                                                                                                                                                                                                                          | 8-16              | .1163  | 8-16                                      | .1725  | 8-16    | .1849  | 8-16    | .1921                            | 8-16     | .1921  | 8-16  | .1921  | 8-16   | .1921  | 8-14   | .3493  |
| 1959                                                                                                                                                                                                                                          | 7-26              | .4032  | 7-26                                      | .1075  | 7-26    | .1420  | 7-26    | .1520                            | 7-26     | .1521  | 7-26  | .1521  | 7-26   | .1521  | 7-20   | .2327  |
| Notes: Quality of record: P, poor in 1954 and 1955; good, 1956 through 1959. Q, poor, 1954 through 1959.<br>Monthly P is arithmetic average of raingages.<br>Normal P based on 60 years record (1897-1957), USWB Station, Tombstone, Arizona. |                   |        |                                           |        |         |        |         |                                  |          |        |       |        |        |        |        |        |

| SELECTED RUNOFF EVENTS                                                                                          |                      |                    |                  |                      |                  | Tombstone, Arizona Watershed W-5 |                 |                  |
|-----------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|----------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                           |                      |                    | Rainfall         |                      |                  | Runoff                           |                 |                  |
| Date                                                                                                            | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                 | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of October 4, 1954                                                                                        |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage<br>8-11-54                                                                                             | 29<br>0.11           | 0                  | 10-4-54<br>8:30p | Raingage<br>0        | 29<br>0          | 10-4-54<br>7:15p                 | 0               | 0                |
|                                                                                                                 |                      |                    | :32              | .30                  | .01              | :20                              | .0002           | 0                |
|                                                                                                                 |                      |                    | :46              | 3.00                 | .71              | :40                              | .6390           | .1065            |
|                                                                                                                 |                      |                    | :50              | .30                  | .76              | :50                              | .9540           | .2393            |
| Raingage<br>8-11-54                                                                                             | 30<br>0.07           | 0                  | 7:07             | 1.31                 | 1.00             | 8:17                             | .4284           | .5507            |
|                                                                                                                 |                      |                    | :30              | .03                  | 1.01             | :32                              | .3114           | .6432            |
|                                                                                                                 |                      |                    | 10-4-54          | Raingage             | 36               | :45                              | .2610           | .7054            |
|                                                                                                                 |                      |                    | 8:50             | 0                    | 0                | 9:08                             | .2124           | .7961            |
|                                                                                                                 |                      |                    | 8:10             | .06                  | .02              | :50                              | .1071           | .9078            |
|                                                                                                                 |                      |                    | :02              | 6.26                 | .75              | 10:18                            | .0711           | .9494            |
|                                                                                                                 |                      |                    | :36              | 3.21                 | 1.50             | 11:25                            | .0329           | 1.0076           |
|                                                                                                                 |                      |                    | :45              | 7.12                 | 2.57             | 10-5-54<br>12:55a                | .0151           | 1.0436           |
|                                                                                                                 |                      |                    | 10:18            | .01                  | 2.60             | 2:05                             | .0088           | 1.0576           |
|                                                                                                                 |                      |                    |                  |                      |                  | 3:00                             | .0061           | 1.0644           |
|                                                                                                                 |                      |                    |                  |                      |                  | 4:00                             | .0047           | 1.0698           |
|                                                                                                                 |                      |                    |                  |                      |                  | 9:10                             | .0022           | 1.0874           |
|                                                                                                                 |                      |                    |                  |                      |                  | 11:30                            | .0013           | 1.0916           |
|                                                                                                                 |                      |                    |                  |                      |                  | 1:30p                            | .0005           | 1.0934           |
|                                                                                                                 |                      |                    |                  |                      |                  | 2:05                             | .0001           | 1.0936           |
|                                                                                                                 |                      |                    |                  |                      |                  | 4:05                             | 0               | 1.0936           |
| Event of August 17, 1957                                                                                        |                      |                    |                  |                      |                  |                                  |                 |                  |
| Raingage<br>7-19-57                                                                                             | 29<br>0.42           | 0                  | 8-17-57          | Raingage             | 29               | 8-17-57                          | 0               | 0                |
| 7-24                                                                                                            | .13                  | 0                  | 8:48p            | 0                    | 0                | 8:57p                            | 0               | 0                |
| 7-25                                                                                                            | .02                  | 0                  | 9:05             | 4.66                 | 1.32             | 9:00                             | .0446           | .0011            |
| 7-26                                                                                                            | .23                  | 0                  | :22              | .00                  | 1.45             | :05                              | .1390           | .0087            |
| 7-29                                                                                                            | 1.01                 | .02                | :25              | 2.00                 | 1.55             | :10                              | .2542           | .0251            |
| 7-31                                                                                                            | .04                  | 0                  | :30              | .60                  | 1.60             | :15                              | .3960           | .0522            |
| 8-2                                                                                                             | 1.25                 | .05                | :35              | 1.44                 | 1.72             | :20                              | .5652           | .0922            |
| 8-5                                                                                                             | 1.00                 | .02                | :48              | .18                  | 1.76             | :25                              | .3996           | .1324            |
| 8-8                                                                                                             | .72                  | .13                | :50              | .90                  | 1.79             | :30                              | .2700           | .1603            |
| 8-9                                                                                                             | .28                  | .08                | 10:05            | .08                  | 1.81             | :35                              | .1710           | .1787            |
| 8-12                                                                                                            | .05                  | 0                  | :20              | .04                  | 1.82             | :40                              | .1125           | .1905            |
| 8-14                                                                                                            | .17                  | 0                  |                  |                      |                  | :50                              | .0652           | .2053            |
| 8-16                                                                                                            | .34                  | 0                  |                  |                      |                  | 10:00                            | .0403           | .2141            |
|                                                                                                                 |                      |                    |                  |                      |                  | :20                              | .0202           | .2242            |
|                                                                                                                 |                      |                    |                  |                      |                  | 11:00                            | .0112           | .2347            |
| Raingage<br>7-19-57                                                                                             | 42<br>0.13           | 0                  | 8-17-57          | Raingage             | 42               | 12:00m                           | .0040           | .2423            |
| 7-24                                                                                                            | .59                  | 0                  | 8:05p            | 0                    | 0                | 8-18-57                          | 0               | 0                |
| 7-25                                                                                                            | .10                  | 0                  | :15              | 1.38                 | .23              | 2:00a                            | .0007           | .2471            |
| 7-26                                                                                                            | .17                  | 0                  | :31              | .60                  | .34              | 6:00                             | .0002           | .2491            |
| 7-29                                                                                                            | .58                  | 0                  | :33              | .90                  | .52              | 12:00n                           | 0               | .2497            |
| 7-31                                                                                                            | .35                  | 0                  | :40              | 4.20                 | 1.01             |                                  |                 |                  |
| 8-2                                                                                                             | 1.18                 | 0                  | :55              | 2.76                 | 1.70             |                                  |                 |                  |
| 8-5                                                                                                             | .95                  | 0                  | 9:02             | .86                  | 1.80             |                                  |                 |                  |
| 8-7                                                                                                             | .05                  | 0                  | :10              | .30                  | 1.84             |                                  |                 |                  |
| 8-8                                                                                                             | .98                  | 0                  | :19              | .47                  | 1.91             |                                  |                 |                  |
| 8-9                                                                                                             | .33                  | 0                  | :35              | .34                  | 2.00             |                                  |                 |                  |
| 8-11                                                                                                            | .10                  | 0                  | :50              | .24                  | 2.06             |                                  |                 |                  |
| 8-14                                                                                                            | .18                  | 0                  | 10:05            | .12                  | 2.09             |                                  |                 |                  |
| 8-16                                                                                                            | .08                  | 0                  |                  |                      |                  |                                  |                 |                  |
| WATERSHED CONDITIONS: Desert shrubs (white horn, tarbush, creosotebush) cover 25%. Grassland, grass canopy 22%. |                      |                    |                  |                      |                  |                                  |                 |                  |

Notes: To convert runoff in in/hr to cfs, multiply by 5556.

See pp. 1-7 and 13.1-6 for isohyetal maps of events.



TOMBSTONE, ARIZONA Watershed W-5

## SANTA ROSA, NEW MEXICO Watershed W-1

LOCATION: Guadalupe and Quay Counties, 40 miles east of Santa Rosa; Alamogordo Creek, tributary of Pecos River.

AREA: 11 sq. mi. (28,380 ac.) SHAPE: Fairly approximately 11 miles wide by 11 miles long.

SLOPES: Not available

SOILS: Not available

EROSION: 1 - 10% 2 - 10% 3 - 10%

LAND CAPABILITY: V - 65%; VII - 5%; VIII - 30%

SURFACE DRAINAGE: Fair, moderate irregular channel system, with water shed outlet at tributary 1 mile, and up the two principal lower tributaries. Remainder of watershed has broad wash, reaches, with poorly defined channels.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff-critical depth flume, recorder with 12 hr. chart; Precipitation - 55 recording raingages, 24 hr. charts.

WATERSHED CONDITIONS: Grazing land. About 75% of the area is grassland, vegetation consisting of blue grama, galleta, buffalo and ring muhly. Remaining 25% of area is pinon, juniper, and various shrubs, with some grasses interspersed.

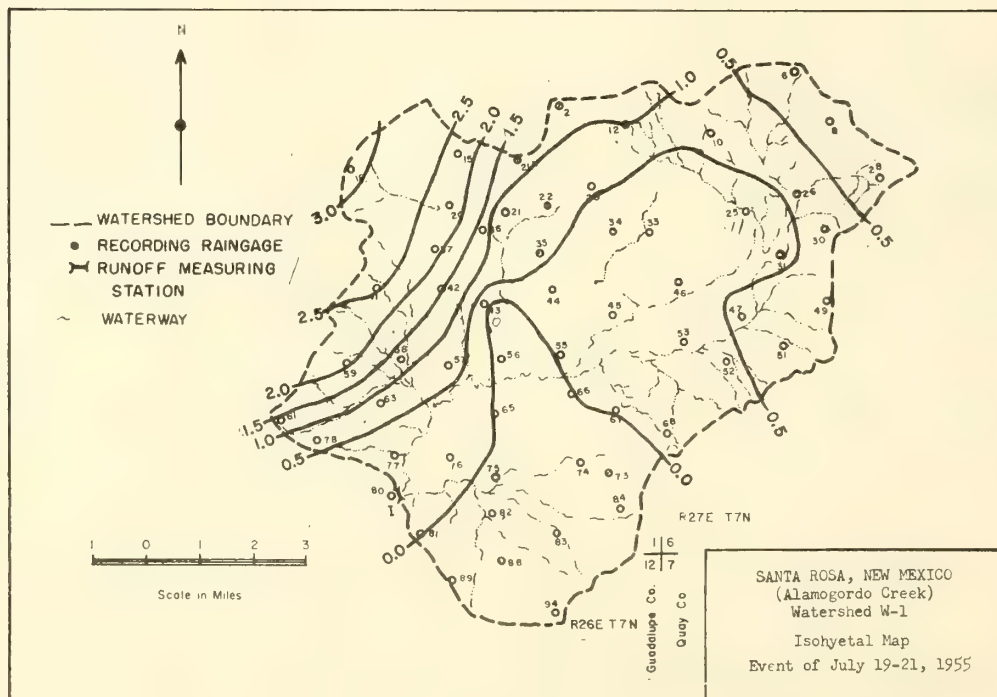
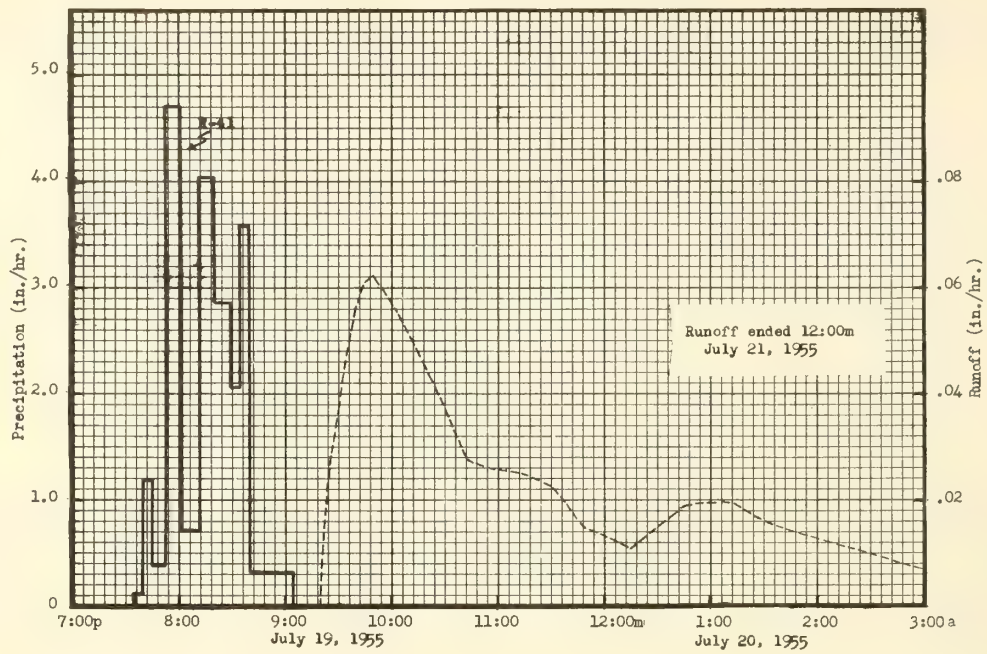
GENERALLY REPRESENTS: Grazing lands in the Pecos-Canadian Plains and Valleys resource area (G-70) in eastern New Mexico and southern Colorado.

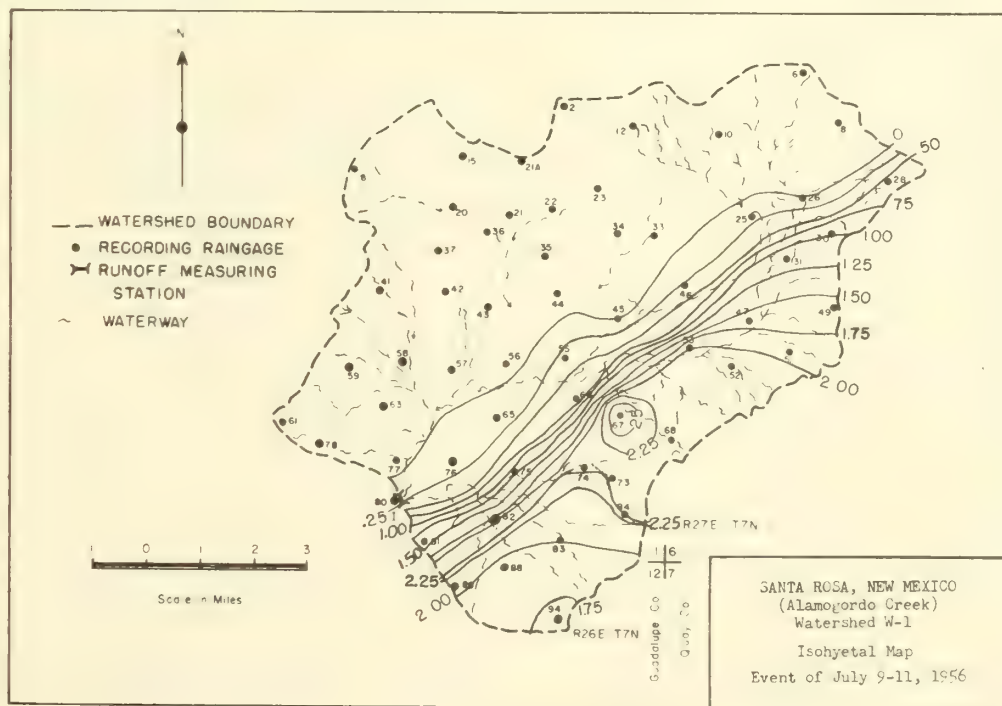
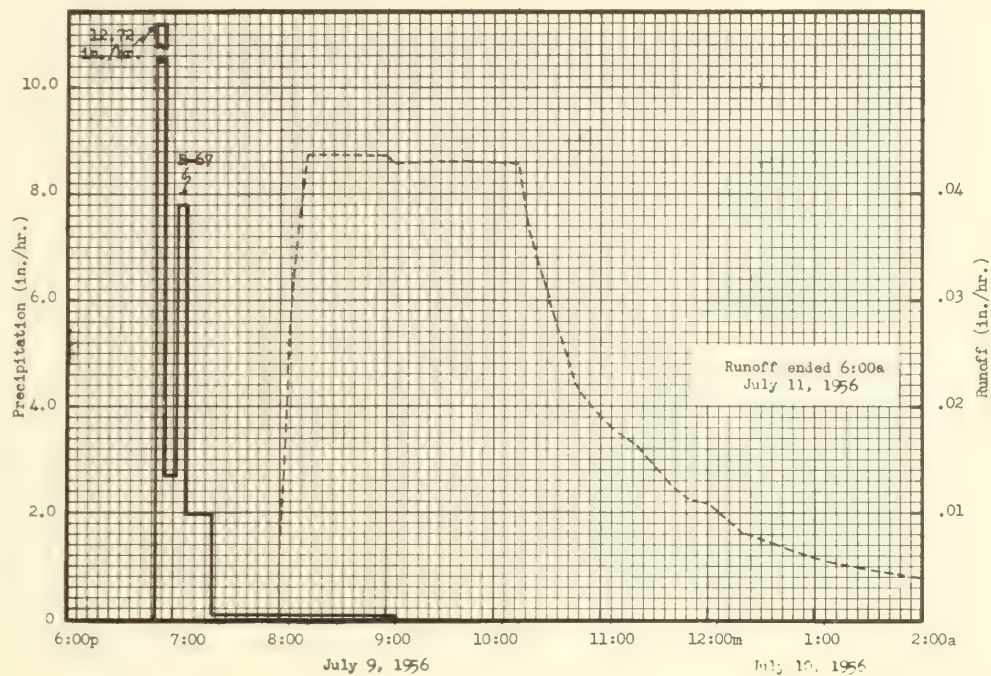
| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                               |                   |       |                                           |       |         |       |         | Santa Rosa, New Mexico Watershed W-1 |          |       |       |       |        |       |        |       |
|-------------------------------------------------------------------------------------------------------------------------|-------------------|-------|-------------------------------------------|-------|---------|-------|---------|--------------------------------------|----------|-------|-------|-------|--------|-------|--------|-------|
| Month<br>Year                                                                                                           | Jan.              | Feb.  | Mar.                                      | Apr.  | May     | June  | July    | Aug.                                 | Sept.    | Oct.  | Nov.  | Dec.  | Year   |       |        |       |
| 1955 1/ P                                                                                                               | 0.03              | 0     | 0.01                                      | 0.14  | 0.32    | 0.25  | 4.10    | 2.41                                 | 2.12     | 0.30  | 0     | 0     | 9.68   |       |        |       |
| 1956 P                                                                                                                  | 0                 | 0     | 0                                         | .01   | 0       | 0     | nr      | nr                                   | nr       | nr    | 0     | 0     | .01    |       |        |       |
| 1957 P                                                                                                                  | 0                 | 0     | 0                                         | .03   | .39     | .56   | 2.10    | .73                                  | T        | .45   | 0     | .01   | 4.27   |       |        |       |
| 1958 P                                                                                                                  | 0                 | 0     | 0                                         | 0     | 0       | T     | .21     | T                                    | 0        | 0     | 0     | 0     | .21    |       |        |       |
| 1959 P                                                                                                                  | .08               | .24   | .00                                       | .45   | 1.12    | .05   | 1.25    | 1.84                                 | .52      | 1.97  | .25   | .00   | 8.42   |       |        |       |
| 1960 P                                                                                                                  | 0                 | 0     | 0                                         | T     | .01     | 0     | .04     | .11                                  | .03      | .01   | 0     | 0     | .20    |       |        |       |
| 1961 P                                                                                                                  | .49               | .16   | 1.70                                      | .59   | .71     | .59   | 2.19    | 1.22                                 | 1.70     | .37   | .12   | .26   | 10.56  |       |        |       |
| 1962 P                                                                                                                  | 0                 | 0     | 0                                         | 0     | T       | 0     | 0       | .15                                  | .04      | 0     | 0     | 0     | .19    |       |        |       |
| 1963 P                                                                                                                  | .13               | .09   | .07                                       | .10   | 1.72    | 2.28  | 1.28    | 3.10                                 | .09      | .00   | .06   | 2.10  | 12.18  |       |        |       |
| 1964 P                                                                                                                  | 0                 | 0     | 0                                         | 0     | .02     | .01   | 0       | .02                                  | 0        | 0     | 0     | 0     | .05    |       |        |       |
| Normal P 1/                                                                                                             | .45               | .43   | .51                                       | .72   | 1.70    | 1.50  | 2.33    | 2.24                                 | 1.72     | .97   | .36   | .41   | 13.30  |       |        |       |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS |                   |       |                                           |       |         |       |         | Santa Rosa, New Mexico Watershed W-1 |          |       |       |       |        |       |        |       |
| YEAR                                                                                                                    | MAXIMUM DISCHARGE |       | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |       |         |       |         |                                      |          |       |       |       |        |       |        |       |
|                                                                                                                         |                   |       | 1 hour                                    |       | 2 hours |       | 6 hours |                                      | 12 hours |       | 1 day |       | 2 days |       | 8 days |       |
|                                                                                                                         | Date              | Rate  | Date                                      | Vol.  | Date    | Vol.  | Date    | Vol.                                 | Date     | Vol.  | Date  | Vol.  | Date   | Vol.  | Date   | Vol.  |
| 1955 1/                                                                                                                 | 7-19              | .0622 | 7-9                                       | .0459 | 7-9     | .0552 | 7-9     | .1309                                | 7-9      | .1454 | 7-9   | .1500 | 7-9    | .1622 | 7-9    | .1622 |
| 1956                                                                                                                    | 7-9               | .0433 | 7-9                                       | .0343 | 7-1     | .0547 | 8-16    | .0822                                | 8-16     | .0901 | 8-1   | .0901 | 8-16   | .1037 | 3-14   | .1100 |
| 1957                                                                                                                    | 8-10              | .0253 | 8-16                                      | .0343 | 8-1     | .0547 | 8-16    | .0822                                | 8-16     | .0901 | 8-1   | .0901 | 8-16   | .1037 | 3-14   | .1100 |
| 1958                                                                                                                    | 8-17              | .0380 | 8-17                                      | .0365 | 8-17    | .0646 | 8-1     | .1342                                | 8-16     | .1475 | 8-16  | .1576 | 8-16   | .1576 | 8-16   | .1576 |
| 1959                                                                                                                    | 8-17              | .0380 | 5-16                                      | .0079 | 5-16    | .0113 | 5-16    | .0193                                | 5-16     | .0210 | 5-16  | .0210 | 5-16   | .0210 | 5-16   | .0210 |
| Notes: Quantity of records: Monthly P and Q, Good; Annual Maximum Discharges in volume, Good.                           |                   |       |                                           |       |         |       |         |                                      |          |       |       |       |        |       |        |       |
| 1/ Incomplete record for 1955.                                                                                          |                   |       |                                           |       |         |       |         |                                      |          |       |       |       |        |       |        |       |
| 2/ Normal precipitation based on 30 years record at Santa Rosa, New Mexico located 30 miles west of the watershed.      |                   |       |                                           |       |         |       |         |                                      |          |       |       |       |        |       |        |       |



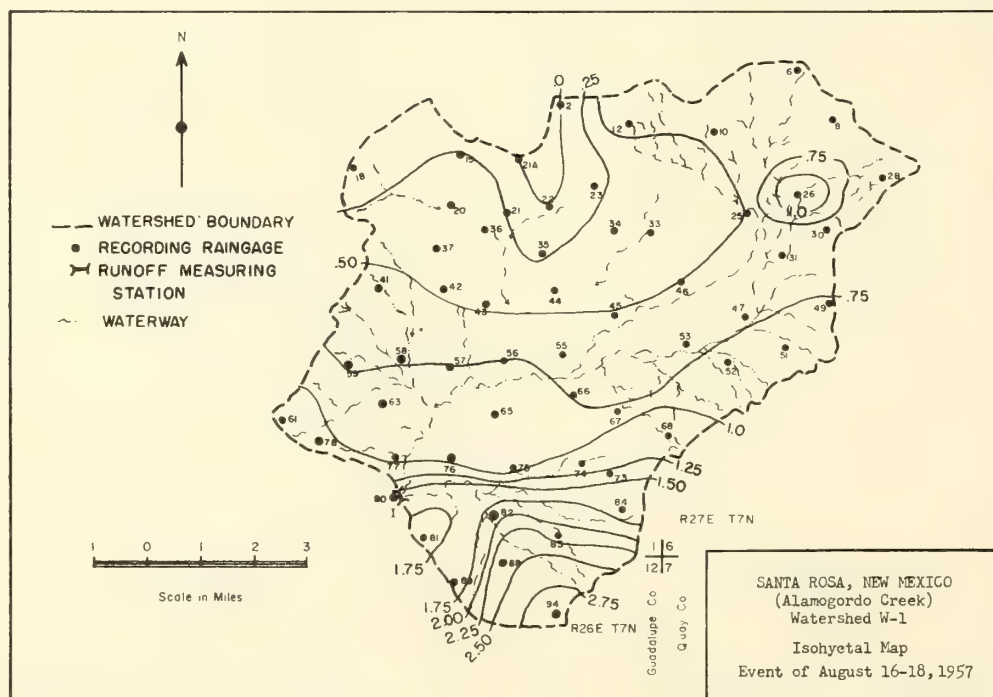
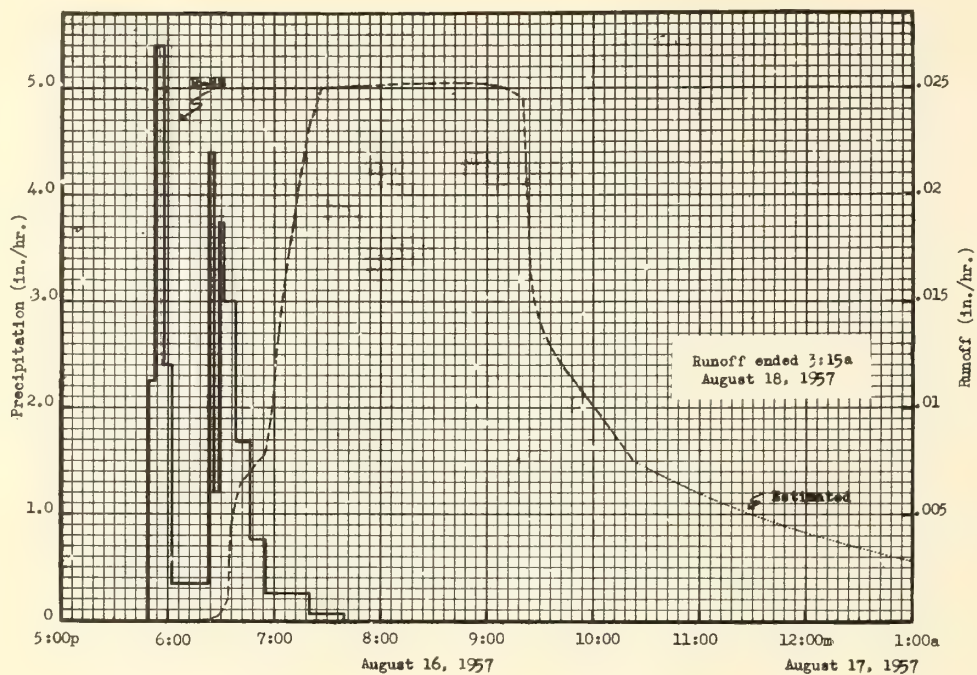
| SELECTED RUNOFF EVENTS                                        |                      |                    |                  |                      |                  | Santa Rosa, New Mexico Watershed W-1 |                 |                  |
|---------------------------------------------------------------|----------------------|--------------------|------------------|----------------------|------------------|--------------------------------------|-----------------|------------------|
| Antecedent conditions                                         |                      |                    | Rainfall         |                      |                  | Runoff                               |                 |                  |
| Date                                                          | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                     | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 19-21, 1955                                     |                      |                    |                  |                      |                  |                                      |                 |                  |
| Raingage # R-18                                               |                      |                    |                  |                      |                  |                                      |                 |                  |
| 6-20-55                                                       | 0.08                 | 0                  | 7-19-55          | Raingage             | R-18             | 7-19-55                              |                 |                  |
| 7-4                                                           | 1.52                 | .0006              | 7:40p            | 0                    |                  | 9:20p                                | 0               | 0                |
| 7-15                                                          | .84                  | 0                  | :52              | .25                  | .05              | :25                                  | .0262           | .0011            |
| 7-19                                                          | 1.00                 | 0                  | 8:01             | 5.13                 | .82              | :30                                  | .0366           | .0037            |
|                                                               |                      |                    | :14              | 2.90                 | 1.45             | :35                                  | .0491           | .0073            |
|                                                               |                      |                    | 8:30             | .11                  | 1.48             | :40                                  | .0576           | .0118            |
|                                                               |                      |                    | :42              | .70                  | 1.62             | :45                                  | .0611           | .0167            |
|                                                               |                      |                    | :55              | 1.52                 | 1.95             | :50                                  | .0622           | .0219            |
|                                                               |                      |                    | 9:02             | 4.12                 | 2.43             | 10:00                                | .0575           | .0317            |
|                                                               |                      |                    | :14              | 2.65                 | 2.96             | :15                                  | .0477           | .0448            |
|                                                               |                      |                    | :25              | .65                  | 3.08             | :30                                  | .0378           | .0557            |
|                                                               |                      |                    | :33              | .08                  | 3.09             | :45                                  | .0277           | .0639            |
|                                                               |                      |                    |                  |                      |                  | :55                                  | .0260           | .0686            |
|                                                               |                      |                    |                  |                      |                  | 11:15                                | .0251           | .0772            |
|                                                               |                      |                    |                  |                      |                  | :30                                  | .0227           | .0833            |
| Raingage # R-41                                               |                      |                    |                  |                      |                  |                                      |                 |                  |
| 6-20-55                                                       | 0.20                 | 0                  | 7-19-55          | Raingage             | R-41             | :45                                  | .0165           | .0881            |
| 7-4                                                           | .48                  | .0006              | 7:35p            | 0                    |                  | :50                                  | .0154           | .0894            |
| 7-15                                                          | .28                  | 0                  | :40              | .12                  | .01              | 12:00m                               | .0135           | .0918            |
|                                                               |                      |                    | :45              | 1.20                 | .11              | 7-20-55                              |                 |                  |
|                                                               |                      |                    | :53              | .38                  | .16              | 12:15a                               | .0111           | .0949            |
|                                                               |                      |                    | 8:01             | 4.72                 | .79              | :25                                  | .0141           | .0971            |
|                                                               |                      |                    | :12              | .71                  | .92              | :45                                  | .0188           | .1027            |
|                                                               |                      |                    | :20              | 4.05                 | 1.46             | :50                                  | .0194           | .1043            |
|                                                               |                      |                    | :30              | 2.88                 | 1.94             | 1:00                                 | .0197           | .1075            |
|                                                               |                      |                    | :35              | 2.04                 | 2.11             | :15                                  | .0188           | .1124            |
|                                                               |                      |                    | :40              | 3.60                 | 2.41             | :35                                  | .0158           | .1182            |
|                                                               |                      |                    | 9:05             | .31                  | 2.54             | 2:40                                 | .0088           | .1316            |
|                                                               |                      |                    |                  |                      |                  | 3:20                                 | .0058           | .1365            |
|                                                               |                      |                    |                  |                      |                  | 7-21-55                              |                 |                  |
|                                                               |                      |                    |                  |                      |                  | 12:00m                               | 0               | .1476            |
| Event of July 9-11, 1956                                      |                      |                    |                  |                      |                  |                                      |                 |                  |
| Raingage # R-67                                               |                      |                    |                  |                      |                  |                                      |                 |                  |
| 6-7-56                                                        | 0.17                 | 0.002              | 7-9-56           | Raingage             | R-67             | 7-9-56                               |                 |                  |
| 6-8                                                           | .18                  | .001               | 8:50p            | 0                    |                  | 8:00a                                | 0               | 0                |
| 6-17                                                          | .05                  | 0                  | :55              | 12.72                | 1.06             | :05                                  | .0262           | T                |
|                                                               |                      |                    | 7:02             | 2.66                 | 1.37             | :10                                  | .0366           | .0037            |
|                                                               |                      |                    | :07              | 7.80                 | 2.02             | :15                                  | .0436           | .0071            |
|                                                               |                      |                    | :22              | 1.96                 | 2.51             | :55                                  | .0437           | .0362            |
|                                                               |                      |                    | 9:05p            | .04                  | 2.57             | 9:00                                 | .0435           | .0398            |
|                                                               |                      |                    |                  |                      |                  | :05                                  | .0428           | .0434            |
|                                                               |                      |                    |                  |                      |                  | :50                                  | .0431           | .0756            |
|                                                               |                      |                    |                  |                      |                  | 10:05                                | .0429           | .0864            |
| Raingage # R-89                                               |                      |                    |                  |                      |                  |                                      |                 |                  |
| 6-8-56                                                        | 0.12                 | 0.001              | 7-9-56           | Raingage             | R-89             | :15                                  | .0427           | .0935            |
| 6-17                                                          | .02                  | 0                  | 7:15p            | 0                    |                  | :20                                  | .0366           | .0968            |
| 6-20                                                          | .05                  | 0                  | :20              | 1.80                 | .15              | :25                                  | .0335           | .0998            |
| 7-2                                                           | .07                  | 0                  | :30              | 5.22                 | 1.02             | :30                                  | .0310           | .1025            |
| 7-4                                                           | .06                  | 0                  | :33              | 10.00                | 1.52             | :35                                  | .0276           | .1049            |
|                                                               |                      |                    | :35              | 8.40                 | 1.80             | :40                                  | .0255           | .1071            |
|                                                               |                      |                    | :40              | 1.80                 | 1.95             | :45                                  | .0225           | .1091            |
|                                                               |                      |                    | :56              | .56                  | 2.10             | 11:00                                | .0190           | .1146            |
|                                                               |                      |                    | 8:55             | 0                    | 2.10             | :20                                  | .0164           | .1204            |
|                                                               |                      |                    | 9:15p            | .24                  | 2.16             | :30                                  | .0143           | .1231            |
| Continued on next page                                        |                      |                    |                  |                      |                  |                                      |                 |                  |
| Notes: To convert runoff in in/hr to cfs, multiply by 43,240. |                      |                    |                  |                      |                  |                                      |                 |                  |

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                           |                      |                     |                  |                      |                  | Santa Rosa, New Mexico Watershed W-1 |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|------------------|----------------------|------------------|--------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                            |                      |                     | Rainfall         |                      |                  | Runoff                               |                 |                  |
| Date                                                                                                                                                                                                                                             | Rainfall<br>(inches) | Runoff<br>(inches)  | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                     | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of July 9-11, 1956 - Continued                                                                                                                                                                                                             |                      |                     |                  |                      |                  |                                      |                 |                  |
| <p>WATERSHED CONDITIONS: Grazing land. About 75% of the area is grassland, vegetation consisting of blue grama, galleta, buffalo and ring muhly. Remaining 25% of area is pinon, juniper and various shrubs, with some grasses interspersed.</p> |                      |                     |                  |                      |                  | 11:40p                               | .0124           | .1255            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :50                                  | .0111           | .1275            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 12:00m                               | .0109           | .1293            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 7-10-56                              |                 |                  |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 12:20a                               | .0080           | .1325            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :35                                  | .0073           | .1344            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 1:00                                 | .0057           | .1372            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :47                                  | .0042           | .1412            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 2:50                                 | .0030           | .1450            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 3:25                                 | .0022           | .1470            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 7-11-56                              |                 |                  |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 6:00a                                | 0               | .1622            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  |                                      |                 |                  |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  |                                      |                 |                  |
| Event of August 16-18, 1957                                                                                                                                                                                                                      |                      |                     |                  |                      |                  |                                      |                 |                  |
| Raingage #                                                                                                                                                                                                                                       | R-88                 |                     | 8-16-57          | Raingage             | R-88             | 8-16-57                              |                 |                  |
| 7-16-57                                                                                                                                                                                                                                          | 0.10                 | 0                   | 5:49p            | 0.                   | 0.               | 5:20p                                | 0               | 0                |
| 7-24                                                                                                                                                                                                                                             | .41                  | 0                   | :53              | 2.25                 | .15              | :29                                  | .0004           | .0001            |
| 7-25                                                                                                                                                                                                                                             | .15                  | 0                   | :58              | 5.40                 | .60              | :34                                  | .0010           | .0002            |
| 7-26                                                                                                                                                                                                                                             | .07                  | 0                   | 5:02             | 2.40                 | .76              | :42                                  | .0045           | .0009            |
| 7-27                                                                                                                                                                                                                                             | .01                  | 0                   | :22              | .33                  | .87              | :48                                  | .0065           | .0015            |
| 7-28                                                                                                                                                                                                                                             | .05                  | 0                   | :25              | 4.40                 | 1.09             | :55                                  | .0079           | .0023            |
| 7-31                                                                                                                                                                                                                                             | .44                  | .0036               | :28              | 1.20                 | 1.15             | :59                                  | .0100           | .0029            |
| 8-2                                                                                                                                                                                                                                              | .05                  | 0                   | :32              | 3.75                 | 1.40             | 7:03                                 | .0136           | .0037            |
| 8-7                                                                                                                                                                                                                                              | .10                  | 0                   | :37              | 3.00                 | 1.65             | :10                                  | .0179           | .0055            |
| 8-16                                                                                                                                                                                                                                             | .28                  | .0001 <sup>1/</sup> | :47              | 1.68                 | 1.93             | :15                                  | .0209           | .0071            |
|                                                                                                                                                                                                                                                  |                      |                     | :55              | .68                  | 2.02             | :21                                  | .0235           | .0093            |
|                                                                                                                                                                                                                                                  |                      |                     | 7:20             | .24                  | 2.12             | :27                                  | .0250           | .0117            |
|                                                                                                                                                                                                                                                  |                      |                     | :40              | .06                  | 2.14             | :50                                  | .0251           | .0213            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 8:05                                 | .0252           | .0276            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :30                                  | .0253           | .0381            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :50                                  | .0253           | .0465            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 9:00                                 | .0252           | .0528            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :11                                  | .0250           | .0553            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :20                                  | .0245           | .0590            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :25                                  | .0162           | .0607            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :32                                  | .0139           | .0625            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :39                                  | .0128           | .0641            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :46                                  | .0116           | .0656            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :55                                  | .0106           | .0674            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 10:05                                | .0096           | .0690            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | :23                                  | .0075           | .0716            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 11:00 <sup>2/</sup>                  | .0060           | .0757            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 12:00m                               | .0041           | .0807            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 8-17-57                              |                 |                  |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 1:00a                                | .0028           | .0841            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 2:15                                 | .0017           | .0868            |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 8-18-57                              |                 |                  |
|                                                                                                                                                                                                                                                  |                      |                     |                  |                      |                  | 3:15a                                | 0               | .1027            |
| <p>Notes: To convert runoff in in/hr to cfs, multiply by 43,240.<br/> <sup>1/</sup> Local runoff from small shower in immediate vicinity of measuring structure.<br/> <sup>2/</sup> Estimated from 11 p.m. on.</p>                               |                      |                     |                  |                      |                  |                                      |                 |                  |









## NEWELL, SOUTH DAKOTA Watershed W-2

LOCATION: Butte Co.; 33 mi. NE of Newell; Sand Creek; South Missouri River Watershed.

AREA: 115 Acres.

SHAPE: Rectangular, about 3000' long and 1000' wide.

SLOPES: 25% in 1-25' slope group; 65% in 2-20'; 10% in 3-15'; 20% in 16-25%.

ASPECT: NE

SOILS: Residual: 85% - shallowly developed medium textured soils; 15% - moderately deep medium textured, permeability moderate; 15% - solonchaks clay pan soils, slow to very slow permeability; 15% - deep, alluvials, soils undifferentiated; Trace - deep and moderately lean clay with slowly permeable subsoil; Cushman-Chama loams and clay loams 35%; Midway-Painville rock outcrop - 12%; Moline loam - 12%; Slosser clay sandy loam - 12%; Chama loam 25%; Painville loam and stony loams - 5%; Midway-Lisnas clay loam - 5%; Laramie clay - 2%; Cheater loam - 1%; Hurley clay and silty clay loams - 2%; Armand loam - 1%; Patent clay loam - trace. Internal Drainage - medium.

EROSION: 1 - 100%.

LAND CAPABILITY: 15% = 34%; 15% = 7%; 15% = 16%; 15% = 24%; 15% = 30%.

SURFACE DRAINAGE: Good, well-developed drainage, length 3000', two other roads 400' each.

CHARACTER OF PLANT: Sphaeral, continuous.

INSTRUMENTATION: Rainfall: A-25 recorder on stock pen. Precipitation: One recording gage. Early precipitation records from 1 in. gage on George Johnson ranch 3 miles northwest of dam.

WATER-USE: IRRIGATION: 100% Semiarid. Irrigation classes: Excellent - 10%; Good - 10%; Fair - 10%; Marginal species: Blue grama - 25%; Mixed leaved grass - 12%; Hardpan grass - 5%; Sandberg's blue grass - 2%; needle and thread grass - 2%; western wheat grass - 2%; Buffalo grass - 2%; miscellaneous grasses and forbs - 10%.

Production of cover: 1700 lbs/acre.

Range sizes: Salt - 10%; Milk thistle - 15%; shallow - 15%; perennials - 10%; overflow - 10%.

USE: (Degree of grazing of rangeland) 1957 - close; 1958 - full; 1959 - close.

GENERAL: NOTES: Landmarks or water features: Residual loams and residual plains, west of Newell; especially the soil of soils formed in natural weathering from Fox Hills and Hell Creek formations. Pierre Shale Plains and Badlands land resource area (G-60).

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

Newell, South Dakota Watershed W-2

| Month<br>Year   | Jan.     | Feb.      | Mar.         | Apr.       | May          | June         | July         | Aug.      | Sept.        | Oct.      | Nov.         | Dec.        | Year         |
|-----------------|----------|-----------|--------------|------------|--------------|--------------|--------------|-----------|--------------|-----------|--------------|-------------|--------------|
| 1958 1/2 P<br>O | T        | 0.11<br>T | 0.23<br>.008 | 0.75<br>T  | 0.10<br>T    | 2.64<br>.014 | 2.61<br>.030 | 0.07<br>O | 0.15<br>O    | 0.22<br>O | 0.15<br>.004 | 0.25<br>T   | 8.10<br>.06  |
| 1959 P<br>O     | .21<br>O | .42<br>C  | .06<br>.000  | .78<br>.08 | 2.40<br>.013 | 1.68<br>.004 | 1.98<br>.077 | .71<br>O  | 1.00<br>.010 | .60<br>O  | .66<br>T     | .13<br>.003 | 11.72<br>.43 |
| Normal P        | .44      | .37       | .79          | 1.67       | 2.65         | 2.95         | 2.11         | 1.34      | 1.29         | 1.02      | .55          | .39         | 15.57        |

Notes: 1/ Precipitation prior to 5-2-58 from Johnson's gage.

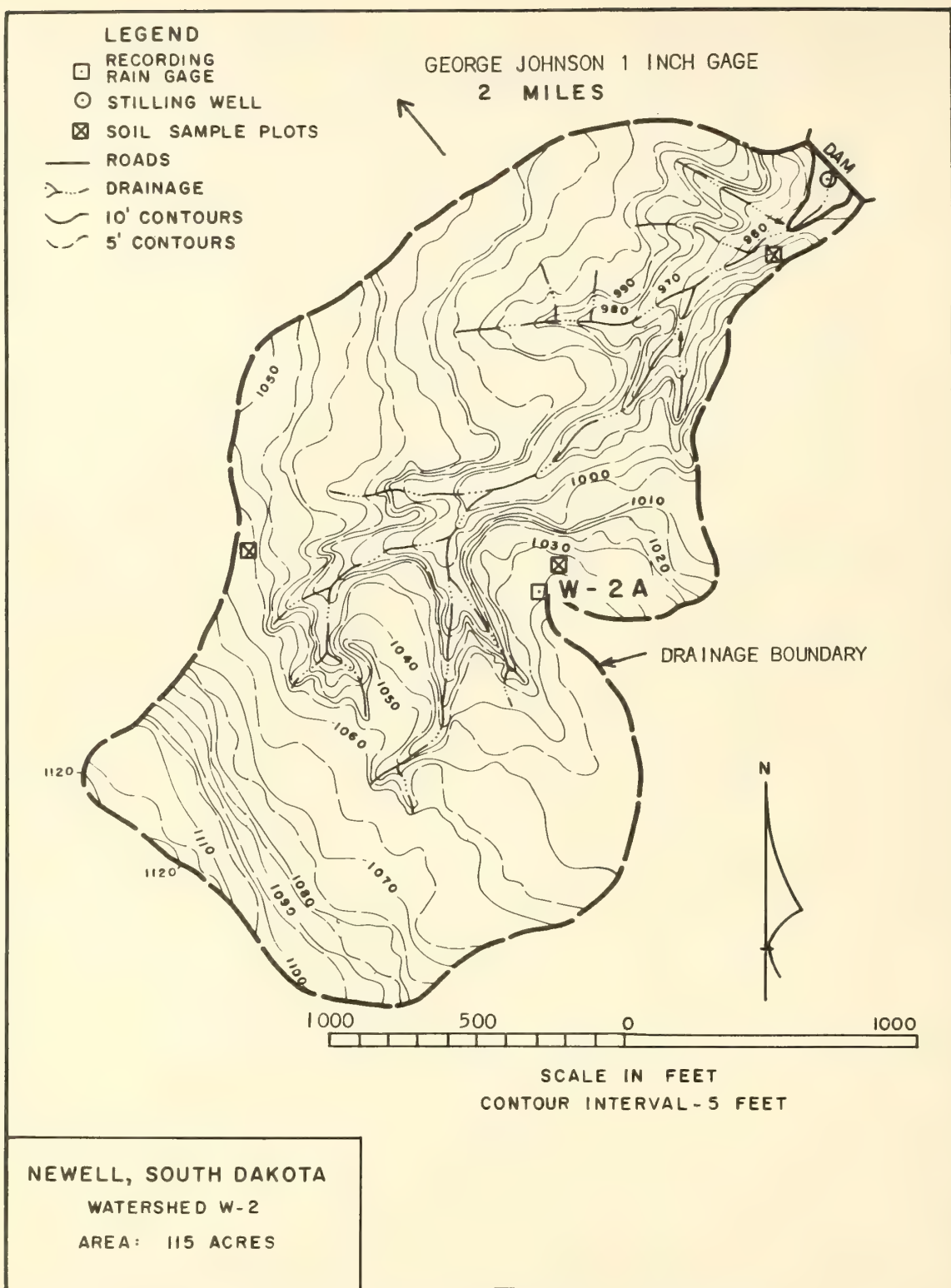
Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.

| DAILY PRECIPITATION AND RUNOFF (Inches) |                         |                  |      |               |                | Newell, South Dakota Watershed W-2 |               |        |
|-----------------------------------------|-------------------------|------------------|------|---------------|----------------|------------------------------------|---------------|--------|
| Date                                    | Precipitation <u>1/</u> | Runoff <u>2/</u> | Date | Precipitation | Runoff         | Date                               | Precipitation | Runoff |
| 1958                                    |                         |                  | 1959 |               |                |                                    |               |        |
| 2-3 <u>2/</u>                           | 0.05                    | 0                | 1-13 | 0.13          | 0              |                                    |               |        |
| 2-18                                    | .05                     | 0                | 1-16 | .03           | 0              |                                    |               |        |
| 2-26                                    | .04                     | 0                | 1-20 | .04           | 0              |                                    |               |        |
| 3-4                                     | .15                     | .006 <u>4/</u>   | 1-24 | .05           | 0              |                                    |               |        |
| 3-13                                    | .08                     | 0                | 1-25 | .02           | 0              |                                    |               |        |
| 3-24                                    | 0                       | .002 <u>4/</u>   | 1-29 | .04           | 0              |                                    |               |        |
| 4-10                                    | .25                     | T <u>4/</u>      | 2-3  | .03           | 0              |                                    |               |        |
| 4-25                                    | nr                      | T <u>4/</u>      | 2-4  | .03           | 0              |                                    |               |        |
| 5-2 <u>5/</u>                           | 0                       | T <u>4/</u>      | 2-5  | .06           | 0              |                                    |               |        |
| 5-5 <u>5/</u>                           | 0                       | 0                | 2-9  | .07           | 0              |                                    |               |        |
| 5-24                                    | .03                     | 0                | 2-13 | .10           | 0              |                                    |               |        |
| 5-30                                    | .13                     | 0                | 2-16 | .02           | 0              |                                    |               |        |
| 5-31                                    | .02                     | 0                | 2-17 | .11           | 0              |                                    |               |        |
| 6-1                                     | .04                     | 0                | 3-13 | .03           | 0              |                                    |               |        |
| 6-2                                     | .12                     | 0                | 3-16 | T             | .196 <u>4/</u> |                                    |               |        |
| 6-3                                     | .89                     | .008             | 3-19 | .03           | 0              |                                    |               |        |
| 6-7                                     | .22                     | 0                | 3-22 | 0             | .109 <u>4/</u> |                                    |               |        |
| 6-8                                     | .17                     | 0                | 3-23 | 0             | .004           |                                    |               |        |
| 6-9                                     | .21                     | T                | 4-8  | .03           | 0              |                                    |               |        |
| 6-13                                    | .25                     | 0                | 4-15 | .29           | 0              |                                    |               |        |
| 6-14                                    | .31                     | .003             | 4-16 | .14           | .002           |                                    |               |        |
| 6-15                                    | .20                     | .002             | 4-17 | .08           | 0              |                                    |               |        |
| 6-18                                    | .10                     | 0                | 4-18 | .01           | 0              |                                    |               |        |
| 6-19                                    | .01                     | 0                | 4-19 | .10           | .006           |                                    |               |        |
| 6-20                                    | .04                     | 0                | 4-20 | .07           | 0              |                                    |               |        |
| 6-21                                    | .08                     | 0                | 4-23 | .06           | 0              |                                    |               |        |
| 7-1                                     | .23                     | 0                | 5-4  | .12           | 0              |                                    |               |        |
| 7-2                                     | 1.05                    | .027             | 5-5  | .02           | 0              |                                    |               |        |
| 7-3                                     | .39                     | T                | 5-10 | .18           | 0              |                                    |               |        |
| 7-13                                    | .05                     | 0                | 5-19 | .42           | 0              |                                    |               |        |
| 7-14                                    | .13                     | 0                | 5-20 | .30           | .004           |                                    |               |        |
| 7-19                                    | .11                     | 0                | 5-27 | .05           | 0              |                                    |               |        |
| 7-23                                    | .10                     | 0                | 5-28 | .20           | 0              |                                    |               |        |
| 7-24                                    | .01                     | 0                | 5-29 | .45           | T              |                                    |               |        |
| 7-29                                    | .30                     | 0                | 5-30 | .46           | .007           |                                    |               |        |
| 7-30                                    | .14                     | 0                | 5-31 | .20           | 0              |                                    |               |        |
| 8-3                                     | .03                     | 0                | 6-7  | .03           | 0              |                                    |               |        |
| 8-29                                    | .62                     | 0                | 6-17 | .12           | 0              |                                    |               |        |
| 8-30                                    | .22                     | 0                | 6-21 | .05           | 0              |                                    |               |        |
| 9-4                                     | .10                     | 0                | 6-24 | .45           | 0              |                                    |               |        |
| 9-19                                    | .05                     | 0                | 6-25 | .10           | 0              |                                    |               |        |
| 10-20                                   | .10                     | 0                | 6-26 | .19           | 0              |                                    |               |        |
| 10-21                                   | .12                     | 0                | 6-29 | .08           | 0              |                                    |               |        |
| 11-14                                   | .16                     | 0                | 6-30 | .66           | .004           |                                    |               |        |
| 11-15                                   | .05                     | 0                | 7-1  | 0             | .002           |                                    |               |        |
| 11-16                                   | .13                     | 0                | 7-3  | .10           | 0              |                                    |               |        |
| 11-17                                   | .04                     | 0                | 7-6  | .14           | 0              |                                    |               |        |
| 11-19                                   | T                       | .003             | 7-7  | .70           | .051           |                                    |               |        |
| 11-22                                   | .02                     | 0                | 7-8  | 0             | T              |                                    |               |        |
| 11-23                                   | .05                     | 0                | 7-15 | .81           | .023           |                                    |               |        |
| 12-3                                    | 0                       | 0                | 7-17 | .20           | 0              |                                    |               |        |
| 12-6                                    | .05                     | 0                | 7-21 | .03           | 0              |                                    |               |        |
| 12-7                                    | .04                     | 0                | 7-25 | 0             | 0              |                                    |               |        |
| 12-8                                    | .02                     | 0                | 8-8  | .43           | 0              |                                    |               |        |
| 12-11                                   | .10                     | 0                | 8-12 | .17           | 0              |                                    |               |        |
| 12-12                                   | .01                     | 0                | 8-31 | .11           | 0              |                                    |               |        |
| 12-13                                   | .03                     | 0                | 9-16 | .30           | 0              |                                    |               |        |
|                                         |                         |                  | 9-17 | .71           | .004           |                                    |               |        |
|                                         |                         |                  | 9-18 | 0             | T              |                                    |               |        |
|                                         |                         |                  | 9-20 | .06           | 0              |                                    |               |        |
|                                         |                         |                  | 9-21 | .02           | 0              |                                    |               |        |
|                                         |                         |                  | 9-24 | .37           | 0              |                                    |               |        |
|                                         |                         |                  | 9-25 | .41           | .005           |                                    |               |        |
|                                         |                         |                  | 9-27 | .08           | 0              |                                    |               |        |
|                                         |                         |                  | 9-28 | .03           | 0              |                                    |               |        |

Notes: Quality of records: Precipitation - good except for period before 5-2-59 which are poor; runoff - good, except for period of early snow melt which are fair. Months of Jan., Feb., Mar., Apr., Nov. and Dec. include snow and snow melt 1/ Precipitation prior to 5-2-59 from Johnson's page. 2/ Runoff prior to 5-5-59 based on weekly observations. 3/ Beginning of observations. 4/ Runoff between observation dates. 5/ Recording rain gage installed. 6/ Stage recorder installed.

| DAILY PRECIPITATION AND RUNOFF (Inches)           |               |        |       | Newell, South Dakota Watershed W-2 |                    |      |               |        |
|---------------------------------------------------|---------------|--------|-------|------------------------------------|--------------------|------|---------------|--------|
| Date                                              | Precipitation | Runoff | Date  | Precipitation                      | Runoff             | Date | Precipitation | Runoff |
|                                                   |               |        | 10-9  |                                    |                    |      |               |        |
|                                                   |               |        | 10-29 | 0.01                               | 0                  |      |               |        |
|                                                   |               |        | 10-1  | .01                                | 0                  |      |               |        |
|                                                   |               |        | 10-7  | .20                                | 0                  |      |               |        |
|                                                   |               |        | 10-9  | .31                                | 0                  |      |               |        |
|                                                   |               |        | 10-12 | .08                                | 0                  |      |               |        |
|                                                   |               |        | 11-4  | .18                                | 0                  |      |               |        |
|                                                   |               |        | 11-11 | .03                                | 0                  |      |               |        |
|                                                   |               |        | 11-12 | .25                                | 0                  |      |               |        |
|                                                   |               |        | 11-13 | .02                                | 0                  |      |               |        |
|                                                   |               |        | 11-15 | .07                                | 0                  |      |               |        |
|                                                   |               |        | 11-21 | .01                                | 0                  |      |               |        |
|                                                   |               |        | 11-23 | .30                                | 0                  |      |               |        |
|                                                   |               |        | 12-2  | 0                                  | .003 <sup>1/</sup> |      |               |        |
|                                                   |               |        | 12-3  | .02                                | 0                  |      |               |        |
|                                                   |               |        | 12-4  | .01                                | 0                  |      |               |        |
|                                                   |               |        | 12-20 | .01                                | 0                  |      |               |        |
|                                                   |               |        | 12-21 | .03                                | 0                  |      |               |        |
|                                                   |               |        | 12-26 | .01                                | 0                  |      |               |        |
|                                                   |               |        | 12-27 | .01                                | 0                  |      |               |        |
|                                                   |               |        | 12-31 | .01                                | 0                  |      |               |        |
| Notes: <sup>1/</sup> Runoff between observations. |               |        |       |                                    |                    |      |               |        |





## NEWELL, SOUTH DAKOTA Watershed W-3

LOCATION: Route, No.; 33 mi. NW of Newell; Sand Creek; South Moreau River Watershed.

AREA: 20 Acres.

SHAPE: Half fan, about 1400' wide and 3000' long.

SLOPES: 10% is in 0-3% slope group; 70% in 4-20%; 20% in 2-15%.

ASPECT: N

SOILS: 20% - shallowly developed medium textured soils, moderate permeability; 50% - moderately deep medium soils, moderate permeability; 15% - solidized solonchets clay pan soils, slow to very slow permeability; 4% - moderate deep moderately coarse textured alluvial soils, moderate permeability; 4% - shallow fine textured soils, slow permeability; 3% - moderately deep moderately coarse textured soils, moderately rapid permeability. Cushman-Chama loams and fine sandy loam - 25%; Fairville loam - 15%; Maurine loam - 10%; Bonades loams - 10%; Chama-Patent clay loam - 10%; Lismas-Pierre clay - 25%; Moline loams - 5%; Arnegard loam - 5%; Madras clay loam - 3%. Internal Drainage - medium.

EROSION: 1 - 100%.

LAND CAPABILITY: 100% = 30%; 10% = 30%; 10% = 10%; 10% = 20%; 10% = 20%; 10% = 40%.

SURFACE DRAINAGE: Good, well developed, lengths of reaches 200' and 100'.

CHARACTER OF FLOOD: Ephemeral, continuous.

INSTRUMENTATION: Gageoff: Staff gages only. (Gage to "A" starts in case of runoff). Precipitation: One recording gage. Early precipitation records from 1 in. gage on George Johnson ranch 2 miles northwest of dam.

RANGELAND CONDITIONS: 100% Rangeland. Condition classes: Excellent - 10%; Good - 10%; Fair - 10%. Dominant species: Broad leaf sedge - 10%; Blue grass - 20%; needle and thread - 10%; mixed grasses and forbs - 30%. Production of cover: 100 lbs/acre.

Range uses: Rely - 50%; shallow - 20%; Rangeland - 10%; overflow - 10%; sandy - 10%.

USE: (Degree of grazing of rangeland) 1957 - none; 1958 - slight; 1959 - light.

GENERALLY APPROPRIATE: Rangeland in Powder-Yellowstone National Plains, and National Plains, west Dakota; especially where Box Elder or Hell Creek are near contact of Pierre shale chains. Pierre Shale Plains and Badlands land resource area (G-60).

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

Newell, South Dakota Watershed W-3

| Month<br>Year |              | Jan.   | Feb.      | Mar.        | Apr.      | May          | June      | July         | Aug.      | Sept.     | Oct.      | Nov.      | Dec.      | Year         |
|---------------|--------------|--------|-----------|-------------|-----------|--------------|-----------|--------------|-----------|-----------|-----------|-----------|-----------|--------------|
|               |              |        |           |             |           |              |           |              |           |           |           |           |           |              |
| 1958          | P 1/2<br>Q 0 | T<br>0 | 0.24<br>0 | 0.23<br>0   | 0.75<br>0 | 0.28<br>0    | 2.38<br>T | 2.84<br>.004 | 0.94<br>0 | 0.99<br>0 | 0.13<br>0 | 0.32<br>0 | 0.29<br>0 | 9.39<br>.01  |
| 1959          | P<br>Q       | T .17  | .30<br>C  | .06<br>.103 | .81<br>0  | 2.66<br>.002 | 1.41<br>0 | 1.37<br>T    | .69<br>0  | 1.06<br>0 | .40<br>0  | .53<br>0  | .11<br>0  | 10.46<br>.11 |
| Normal        | P            | .44    | .37       | .79         | 1.67      | 2.65         | 2.95      | 2.11         | 1.34      | 1.29      | 1.02      | .55       | .39       | 15.57        |

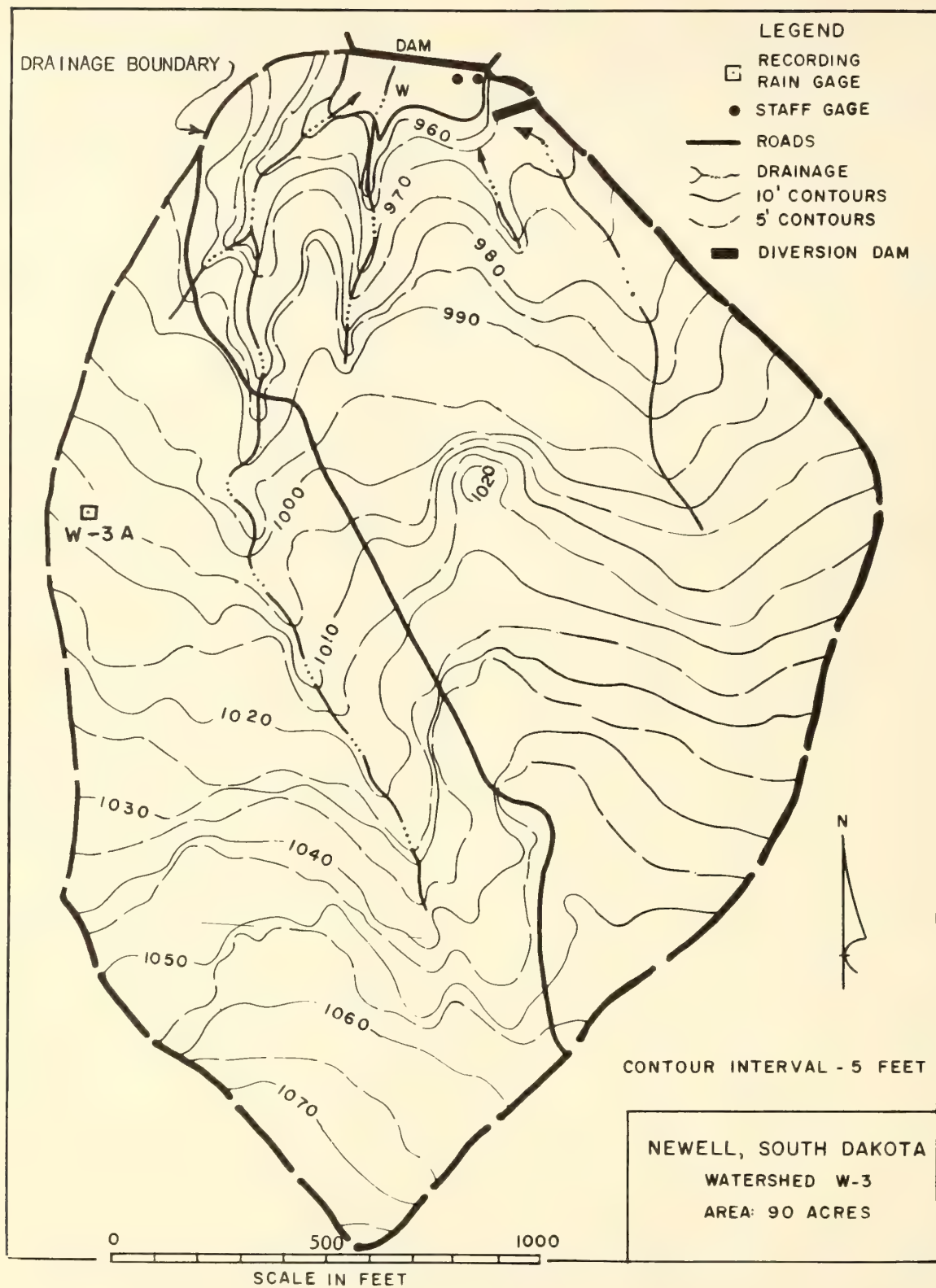
Notes: Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.  
1/ Precipitation prior to 5-2-58 from Johnson's gage.

| DAILY PRECIPITATION AND RUNOFF (Inches) |                             |                      |       | Newell, South Dakota Watershed W-3 |                      |      |               |        |
|-----------------------------------------|-----------------------------|----------------------|-------|------------------------------------|----------------------|------|---------------|--------|
| Date                                    | Precipitation <sup>1/</sup> | Runoff <sup>2/</sup> | Date  | Precipitation                      | Runoff <sup>2/</sup> | Date | Precipitation | Runoff |
| 1958                                    |                             |                      | 1959  |                                    |                      |      |               |        |
| 2-3 <sup>2/</sup>                       | 0.05                        | 0                    | 1-13  | 0.13                               | 0                    |      |               |        |
| 2-18                                    | .07                         | 0                    | 1-16  | .01                                | 0                    |      |               |        |
| 2-27                                    | .12                         | 0                    | 1-25  | .01                                | 0                    |      |               |        |
| 3-4                                     | .15                         | 0                    | 1-29  | .02                                | T <u>1/</u>          |      |               |        |
| 3-13                                    | .08                         | 0                    | 2-3   | .01                                | 0                    |      |               |        |
| 4-10                                    | .25                         | 0                    | 2-4   | .01                                | 0                    |      |               |        |
| 4-25                                    | .50                         | 0                    | 2-5   | .03                                | 0                    |      |               |        |
| 5-2 <sup>5/</sup>                       | 0                           | 0                    | 2-9   | .05                                | 0                    |      |               |        |
| 5-17                                    | .03                         | 0                    | 2-13  | .09                                | 0                    |      |               |        |
| 5-30                                    | .20                         | 0                    | 2-16  | .08                                | 0                    |      |               |        |
| 5-31                                    | .05                         | 0                    | 2-17  | .03                                | 0                    |      |               |        |
| 6-1                                     | .05                         | 0                    | 3-4   | 0                                  | 0                    |      |               |        |
| 6-2                                     | .05                         | 0                    | 3-5   | 0                                  | .005 <u>1/</u>       |      |               |        |
| 6-3                                     | .77                         | e .001               | 3-12  | .01                                | T <u>1/</u>          |      |               |        |
| 6-7                                     | .34                         | 0                    | 3-13  | .02                                | 0                    |      |               |        |
| 6-8                                     | .18                         | 0                    | 3-16  | 0                                  | .091 <u>1/</u>       |      |               |        |
| 6-9                                     | .16                         | 0                    | 3-23  | 0                                  | .004 <u>1/</u>       |      |               |        |
| 6-12                                    | .15                         | 0                    | 3-24  | .03                                | 0                    |      |               |        |
| 6-14                                    | .40                         | 0                    | 4-8   | .03                                | 0                    |      |               |        |
| 6-15                                    | .18                         | 0                    | 4-15  | 1/4                                | 0                    |      |               |        |
| 6-18                                    | .10                         | 0                    | 4-16  | .21                                | 0                    |      |               |        |
| 7-1                                     | .15                         | 0                    | 4-19  | .07                                | 0                    |      |               |        |
| 7-2                                     | 1.10                        | e .001               | 4-25  | .06                                | 0                    |      |               |        |
| 7-3                                     | .35                         | 0                    | 5-4   | .13                                | 0                    |      |               |        |
| 7-13                                    | .05                         | 0                    | 5-5   | .02                                | 0                    |      |               |        |
| 7-14                                    | .17                         | 0                    | 5-10  | .16                                | 0                    |      |               |        |
| 7-15                                    | .05                         | 0                    | 5-19  | .15                                | 0                    |      |               |        |
| 7-19                                    | .15                         | 0                    | 5-20  | .10                                | 0                    |      |               |        |
| 7-24                                    | .05                         | 0                    | 5-27  | .07                                | 0                    |      |               |        |
| 7-25                                    | .35                         | 0                    | 5-28  | .18                                | 0                    |      |               |        |
| 7-29                                    | .30                         | 0                    | 5-29  | .41                                | 0                    |      |               |        |
| 7-30                                    | .12                         | 0                    | 5-30  | .53                                | 0                    |      |               |        |
| 8-3                                     | .10                         | 0                    | 5-31  | .26                                | .002 <u>1/</u>       |      |               |        |
| 8-29                                    | .61                         | 0                    | 6-7   | .06                                | 0                    |      |               |        |
| 8-30                                    | .23                         | 0                    | 6-17  | .10                                | 0                    |      |               |        |
| 9-4                                     | .13                         | 0                    | 6-21  | .10                                | 0                    |      |               |        |
| 9-6                                     | .84                         | 0                    | 6-24  | .14                                | 0                    |      |               |        |
| 9-19                                    | .02                         | 0                    | 6-25  | .01                                | 0                    |      |               |        |
| 10-21                                   | .13                         | 0                    | 6-26  | .10                                | 0                    |      |               |        |
| 11-14                                   | .13                         | 0                    | 6-29  | .10                                | 0                    |      |               |        |
| 11-15                                   | .03                         | 0                    | 6-30  | .50                                | 0                    |      |               |        |
| 11-16                                   | .12                         | 0                    | 7-3   | .15                                | 0                    |      |               |        |
| 11-17                                   | .02                         | 0                    | 7-7   | .34                                | 0                    |      |               |        |
| 11-22                                   | .02                         | 0                    | 7-15  | .61                                | e .001               |      |               |        |
| 12-6                                    | .07                         | 0                    | 7-17  | .23                                | 0                    |      |               |        |
| 12-11                                   | .10                         | 0                    | 7-21  | .04                                | 0                    |      |               |        |
| 12-12                                   | .01                         | 0                    | 8-7   | .04                                | 0                    |      |               |        |
| 12-13                                   | .11                         | 0                    | 8-12  | .15                                | 0                    |      |               |        |
|                                         |                             |                      | 8-31  | .20                                | 0                    |      |               |        |
|                                         |                             |                      | 9-16  | .30                                | 0                    |      |               |        |
|                                         |                             |                      | 9-17  | .71                                | T <u>1/</u>          |      |               |        |
|                                         |                             |                      | 9-20  | .06                                | 0                    |      |               |        |
|                                         |                             |                      | 9-21  | .02                                | 0                    |      |               |        |
|                                         |                             |                      | 9-24  | .37                                | 0                    |      |               |        |
|                                         |                             |                      | 9-25  | .38                                | 0                    |      |               |        |
|                                         |                             |                      | 9-27  | .06                                | 0                    |      |               |        |
|                                         |                             |                      | 9-28  | .05                                | 0                    |      |               |        |
|                                         |                             |                      | 9-29  | .01                                | 0                    |      |               |        |
|                                         |                             |                      | 10-1  | .01                                | 0                    |      |               |        |
|                                         |                             |                      | 10-7  | .17                                | 0                    |      |               |        |
|                                         |                             |                      | 10-9  | .20                                | 0                    |      |               |        |
|                                         |                             |                      | 10-12 | .02                                | 0                    |      |               |        |
|                                         |                             |                      | 11-4  | .11                                | 0                    |      |               |        |
|                                         |                             |                      | 11-11 | .02                                | 0                    |      |               |        |
|                                         |                             |                      | 11-12 | .03                                | 0                    |      |               |        |

Notes: Quality of records: Precipitation - good except for period before 5-2-58 which are poor; runoff - fair. Months of Jan., Feb., Mar., Apr., Nov., and Dec. include snow and snow melt. <sup>1/</sup> Precipitation prior to 5-2-58 from Johnson's page. <sup>2/</sup> Runoff based on weekly observations prior to 6-4-58 and during winter. <sup>3/</sup> Start of observations. <sup>4/</sup> Runoff between observation dates. <sup>5/</sup> Recording rain gage installed.

| DAILY PRECIPITATION AND RUNOFF (Inches)                                 |               |        |       |               | Newell, South Dakota Watershed V-3 |      |               |        |
|-------------------------------------------------------------------------|---------------|--------|-------|---------------|------------------------------------|------|---------------|--------|
| Date                                                                    | Precipitation | Runoff | Date  | Precipitation | Runoff $\frac{1}{2}$               | Date | Precipitation | Runoff |
|                                                                         |               |        | 1959  |               |                                    |      |               |        |
|                                                                         |               |        | 11-13 | .02           | 0                                  |      |               |        |
|                                                                         |               |        | 11-15 | .02           | 0                                  |      |               |        |
|                                                                         |               |        | 11-21 | .02           | 0                                  |      |               |        |
|                                                                         |               |        | 11-22 | .03           | 0                                  |      |               |        |
|                                                                         |               |        | 11-23 | .28           | 0                                  |      |               |        |
|                                                                         |               |        | 12-3  | .02           | 0                                  |      |               |        |
|                                                                         |               |        | 12-7  | .01           | 0                                  |      |               |        |
|                                                                         |               |        | 12-20 | .01           | 0                                  |      |               |        |
|                                                                         |               |        | 12-21 | .02           | 0                                  |      |               |        |
|                                                                         |               |        | 12-26 | .01           | 0                                  |      |               |        |
|                                                                         |               |        | 12-27 | .02           | 0                                  |      |               |        |
|                                                                         |               |        | 12-31 | .02           | 0                                  |      |               |        |
| Notes: $\frac{1}{2}$ Runoff based on weekly observations during winter. |               |        |       |               |                                    |      |               |        |





## NEWELL, SOUTH DAKOTA "Watershed" No. 1

LOCATION: Butte Co., South Dakota; 35 mi. N of Newell; South Moreau River Watershed.

AREA: 108 Acres.

SHAPE: Elliptical, about 1400' wide by 3600' long.

SLOPES: 8% is in 0-3% group; 10% is 3-6%; 12% is 6-18%; 10% is 18-50%.

ASPECT: SE

SOILS: Residual, zonal: 36% - deep moderately coarse textured, moderately rapid permeability; 17% - moderately deep medium textured soils, moderate permeability; 21% - shallowly developed moderately coarse textured soils, moderately rapid permeability; 18% - solodized solonchaks clay pan soils, slow to very slow permeability; 8% - deep moderately fine textured soils, moderately slow permeability; Lihen-Weber loamy fine sand and Weber loams - 27%; Rhoades loams and very fine sandy loams - 15%; Chama-Fairville loam - 11%; Arnerent loam - 9%; Alluvial soils - 8%; Flasher fine sandy loam - 4%; Maurine loam - 4%; Weber-Flasher fine sandy loam - 4%; Reserve loam - 5%; Patent loam - 3%; Reserve-Rhoades loams - 1%. Internal Drainage - medium.

EROSION: 1 - 100%.

LAND CAPABILITY: 11e = 13%; 1Ve = 4%; 1Vs = 7%; 2Ve = 50%; 2Vs = 18%; 2Vw = 8%.

SURFACE DRAINAGE: Good, well developed drainageway, length 3000'; two other reaches, 300' each.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff: A-35 recorder on stock pond. Precipitation: One recording gage. Early precipitation records from 1 in. gage on Riley Price ranch 3 miles southeast of dam.

WATERSHED CONDITIONS: 100% Rangeland. Condition classes: Excellent - 40%; Good - 33%. Dominant species: Blue grama grass - 65%; needle and thread - 25%; thread leaf sedge - 20%; buffalo grass - 10%; prairie sand reed - 10%; western wheat grass - 4%; mixed grasses and forbs - 3%. Production of cover: 1200 lbs.

USE: (Degree of grazing of rangeland) 1957 - moderate; 1958 - moderate; 1959 - moderate.

Range sites: Sandy - 22%; silt - 28%; pansots - 18%; shallow - 21%; overflow - 4%; clayey - 3%.

GENERALLY REPRESENTED: Rangeland in Powder-Yellowstone Basinal Plains and Basinal Plains, west Dakotas, especially moderately coarse textured soils formed in materials weathered from Fox Hills sandstones and sandy shales. Pierre Shale Plains and Badlands land resource area.(G-60)

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

Newell, South Dakota "Watershed" No. 1

| Month<br>Year    | Jan.      | Feb.         | Mar.        | Apr.         | May          | June         | July         | Aug.      | Sept.        | Oct.      | Nov.      | Dec.      | Year         |
|------------------|-----------|--------------|-------------|--------------|--------------|--------------|--------------|-----------|--------------|-----------|-----------|-----------|--------------|
| 1948 P 1/<br>Q T | 0.01<br>T | 0.05<br>.002 | 0.05<br>0   | 0.41<br>.005 | 0.57<br>T    | 1.80<br>.003 | 4.56<br>.441 | 0.80<br>T | 0.17<br>0    | 0.30<br>T | 0.37<br>T | 0.24<br>0 | 9.42<br>.15  |
| 1949 P 2<br>Q 0  | .27<br>0  | .41<br>T     | .27<br>.058 | .56<br>0     | 2.35<br>.004 | 2.11<br>.002 | 1.26<br>.002 | .57<br>0  | 1.52<br>.002 | .47<br>0  | .52<br>0  | .21<br>T  | 10.52<br>.07 |
| Normal P         | .44       | .37          | .79         | 1.67         | 2.65         | 2.95         | 2.11         | 1.34      | 1.29         | 1.02      | .55       | .39       | 15.57        |

Notes: Normal P based on 52 year record (1908-1959) at Newell U.S.W.B. station, Newell, South Dakota.  
1/ Precipitation from Riley Price's gage prior to 4-30-58.

| DAILY PRECIPITATION AND RUNOFF (Inches) |                  |           |      |               |         | Newell, South Dakota Watershed V-4 |               |        |
|-----------------------------------------|------------------|-----------|------|---------------|---------|------------------------------------|---------------|--------|
| Date                                    | Precipitation 1/ | Runoff 2/ | Date | Precipitation | Runoff  | Date                               | Precipitation | Runoff |
| 1958                                    |                  |           | 1959 |               |         |                                    |               |        |
| 1-29 3/                                 | 0.01             | 0.001 4/  | 1-1  | 0.02          | 0.0     |                                    |               |        |
| 2-1                                     | .05              | 0         | 1-13 | .14           | 0       |                                    |               |        |
| 2-24                                    | 0                | .002 4/   | 1-16 | .04           | 0       |                                    |               |        |
| 3-13                                    | .05              | 0         | 1-19 | .02           | 0       |                                    |               |        |
| 4-2                                     | .25              | .002 4/   | 1-24 | .05           | 0       |                                    |               |        |
| 4-10                                    | .15              | 0         | 2-3  | .07           | 0       |                                    |               |        |
| 4-29                                    | .01              | .003 4/   | 2-4  | .08           | 0       |                                    |               |        |
| 4-31 5/                                 | 0                | 0         | 2-5  | .03           | 0       |                                    |               |        |
| 5-21                                    | .08              | 0         | 2-9  | .02           | 0       |                                    |               |        |
| 5-23                                    | .15              | nr        | 2-13 | .09           | .001 4/ |                                    |               |        |
| 5-24                                    | 0                | .001 4/   | 2-17 | .03           | 0       |                                    |               |        |
| 5-30                                    | .30              | nr        | 2-26 | .09           | 0       |                                    |               |        |
| 5-31                                    | .04              | 0         | 3-9  | .07           | 0       |                                    |               |        |
| 6-2                                     | .23              | nr        | 3-11 | 0             | .025 4/ |                                    |               |        |
| 6-3                                     | .37              | nr        | 3-13 | .11           | 0       |                                    |               |        |
| 6-4 6/                                  | 0                | 0 4/      | 3-14 | .01           | 0       |                                    |               |        |
| 6-7                                     | .27              | .002 4/   | 3-15 | .01           | 0       |                                    |               |        |
| 6-8                                     | .10              | 0         | 3-18 | 0             | .032 4/ |                                    |               |        |
| 6-9                                     | .24              | T         | 3-19 | .05           | 0       |                                    |               |        |
| 6-11                                    | .10              | 0         | 3-20 | .02           | 0       |                                    |               |        |
| 6-12                                    | .13              | 0         | 4-15 | .24           | 0       |                                    |               |        |
| 6-13                                    | .40              | 0         | 4-16 | .14           | 0       |                                    |               |        |
| 6-15                                    | .05              | 0         | 4-18 | .07           | 0       |                                    |               |        |
| 7-1                                     | .14              | 0         | 4-19 | .02           | 0       |                                    |               |        |
| 7-2                                     | 2.50             | .137      | 4-20 | .03           | 0       |                                    |               |        |
| 7-3                                     | .04              | 0         | 4-23 | .06           | 0       |                                    |               |        |
| 7-10                                    | .79              | .004      | 5-4  | .19           | 0       |                                    |               |        |
| 7-16                                    | .16              | 0         | 5-10 | .13           | 0       |                                    |               |        |
| 7-19                                    | .44              | 0         | 5-18 | .04           | 0       |                                    |               |        |
| 7-22                                    | .03              | 0         | 5-19 | .10           | 0       |                                    |               |        |
| 7-23                                    | .05              | 0         | 5-20 | .45           | T       |                                    |               |        |
| 7-29                                    | .23              | 0         | 5-21 | .04           | 0       |                                    |               |        |
| 7-30                                    | .13              | 0         | 5-27 | .10           | 0       |                                    |               |        |
| 7-31                                    | .05              | 0         | 5-28 | .12           | 0       |                                    |               |        |
| 8-29                                    | .40              | 0         | 5-29 | .29           | 0       |                                    |               |        |
| 8-30                                    | .40              | T         | 5-30 | .67           | .003    |                                    |               |        |
| 9-4                                     | .15              | 0         | 5-31 | .17           | 0       |                                    |               |        |
| 9-17                                    | .02              | 0         | 6-7  | .15           | 0       |                                    |               |        |
| 10-8                                    | .07              | 0         | 6-15 | .12           | 0       |                                    |               |        |
| 10-21                                   | .20              | 0         | 6-17 | .20           | 0       |                                    |               |        |
| 10-22                                   | .02              | T         | 6-21 | .03           | 0       |                                    |               |        |
| 10-23                                   | .01              | 0         | 6-24 | .36           | T       |                                    |               |        |
| 11-14                                   | .16              | T         | 6-25 | .18           | 0       |                                    |               |        |
| 11-15                                   | .04              | 0         | 6-26 | .22           | 0       |                                    |               |        |
| 11-16                                   | .12              | 0         | 6-29 | .15           | C       |                                    |               |        |
| 11-17                                   | .03              | 0         | 6-30 | .70           | T       |                                    |               |        |
| 11-22                                   | 0                | T         | 7-1  | .01           | 0       |                                    |               |        |
| 11-23                                   | .02 5/           | 0         | 7-3  | .07           | 0       |                                    |               |        |
| 12-7                                    | .10 5/           | 0         | 7-7  | .23           | 0       |                                    |               |        |
| 12-11                                   | .10              | 0         | 7-15 | .00           | .002    |                                    |               |        |
| 12-13                                   | .04              | 0         | 7-17 | .02           | 0       |                                    |               |        |
|                                         |                  |           | 7-21 | .02           | 0       |                                    |               |        |
|                                         |                  |           | 8-5  | .28           | 0       |                                    |               |        |
|                                         |                  |           | 8-8  | .05           | 0       |                                    |               |        |
|                                         |                  |           | 8-12 | .12           | 0       |                                    |               |        |
|                                         |                  |           | 8-22 | .02           | 0       |                                    |               |        |
|                                         |                  |           | 8-31 | .10           | 0       |                                    |               |        |
|                                         |                  |           | 9-16 | .28           | 0       |                                    |               |        |
|                                         |                  |           | 9-17 | .49           | 0       |                                    |               |        |
|                                         |                  |           | 9-18 | .03           | 0       |                                    |               |        |
|                                         |                  |           | 9-21 | .14           | 0       |                                    |               |        |
|                                         |                  |           | 9-24 | .25           | 0       |                                    |               |        |
|                                         |                  |           | 9-25 | .33           | 0       |                                    |               |        |
|                                         |                  |           | 9-26 | 0             | 0       |                                    |               |        |
|                                         |                  |           | 10-7 | .18           | 0       |                                    |               |        |

Notes: Quality of records: Precipitation - good except for period before 4-30-59 which is poor. Runoff - good except for period of snow melt which is fair. Months of Jan., Feb., Mar., Apr., Nov. and Dec. include snow and snow melt. 1/ Precipitation prior to 4-30-59, R. Price gauge. 2/ Runoff, weekly observations prior to 6-4-59. 3/ Start of Observations. 4/ Runoff between observations. 5/ Rain gauge installed. 6/ Storm recorder installed.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       | Newell, South Dakota Watershed No. 1 |        |      |               |        |
|-----------------------------------------|---------------|--------|-------|--------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation                        | Runoff | Date | Precipitation | Runoff |
|                                         |               |        | 1959  |                                      |        |      |               |        |
|                                         |               |        | 10-3  | 0.00                                 | 0      |      |               |        |
|                                         |               |        | 10-12 | .00                                  | 0      |      |               |        |
|                                         |               |        | 11-4  | .13                                  | 0      |      |               |        |
|                                         |               |        | 11-11 | .02                                  | 0      |      |               |        |
|                                         |               |        | 11-12 | .05                                  | 0      |      |               |        |
|                                         |               |        | 11-13 | .02                                  | 0      |      |               |        |
|                                         |               |        | 11-15 | .06                                  | 0      |      |               |        |
|                                         |               |        | 11-23 | .23                                  | 0      |      |               |        |
|                                         |               |        | 11-25 | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-1  | 0                                    | T 1/   |      |               |        |
|                                         |               |        | 12-3  | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-4  | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-18 | .02                                  | 0      |      |               |        |
|                                         |               |        | 12-19 | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-20 | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-21 | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-26 | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-27 | .05                                  | 0      |      |               |        |
|                                         |               |        | 12-31 | .00                                  | 0      |      |               |        |
| Notes: 1/ Runoff between observations.  |               |        |       |                                      |        |      |               |        |





## NEWELL, SOUTH DAKOTA Watershed W-5

LOCATION: Butte Co., South Dakota; 3 1/2 mi. NE of Newell; South Missouri River Watershed.

AREA: 40 Acres.

SHAPE: Triangular, about 2000' long, 1000' wide.

SLOPE: 80% is 3-5%; 10% is 4-10%.

ASPECT: N-NE

SOILS: Residual, zonal 70% - moderately deep and deep moderately coarse to fine soils, moderately rapid permeability 10% - solidized solonchic clay pan soils, slow to very slow permeability; 3% - deep medium textured soils, moderate and moderately slow permeability; 11% - shallow moderately coarse textured soils, moderately rapid permeability. Vebag-Terry fine sandy loams - 15%; Broadus loams - 10%; Timber Lake sandy loam - 10%; -----Flasher fine sandy loam - 8%; Maurice loam - 3%; Flasher fine sandy loam - 3%. Internal Drainage - medium.

EROSION: 1 - 100%.

LAND CAPABILITY: 100% = 10%; 10% = 65%; 10% = 3%; 10% = 11%; 10% = 10%.

SURFACE DRAINAGE: Moderately well drained, channel meander in panspots area, or normal drainage 1700'.

CHARACTER OF PLANT: Perennial, continuous.

INSTANT PLANT: Baroff: A-15 waterstate recorder on stock pond. Precipitation: Baroline gauge.

WATERSHED COMPOSITION: 100% Rangeland. Condition classes: Excellent - 2%; Good - 40%. Dominant species: Needle and thread - 25%; Blue grama - 25%; thread leaf sedge - 20%; Little bluestem, prairie sand reed and forbs - 20%.

Range sites: Sandy - 40%; panspots - 10%; shallow - 11%; silty - 3%.

USE: (Degree of grazing of rangeland) 1957 - full; 1958 - full; 1959 - full.

Reproduction cover: 10% like above.

GENERAL LAND USE: Rangelands in Powder-Yellowstone Residual Plains and Residual Plains, west Dakotas, especially where soils are formed in materials weathered from Fox Hills and Hell Creek formations. Pierre Shale Plains and Badlands land resource area (G-60)

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

## Newell, South Dakota Watershed W-5

| Month<br>Year | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year  |
|---------------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| 1958 P        | 0.11 | 0.52 | 0.57 | 1.57 | 0.12 | 2.97 | 3.56 | 0.27 | 0.16  | 0.18 | 0.20 | 0.21 | 11.17 |
| Q             | 0    | T    | .023 | .020 | 0    | .034 | .201 | .007 | 0     | 0    | 0    | 0    | .29   |
| 1959 P        | .27  | .22  | .21  | .12  | 2.31 | 2.18 | .31  | .51  | 1.11  | .32  | .13  | .28  | 9.00  |
| Q             | 0    | T    | .256 | .010 | .012 | .020 | 0    | 0    | T     | 0    | 0    | 0    | .30   |
| Normal P      | .44  | .37  | .79  | 1.67 | 2.65 | 2.95 | 2.11 | 1.34 | 1.29  | 1.02 | .55  | .39  | 15.57 |

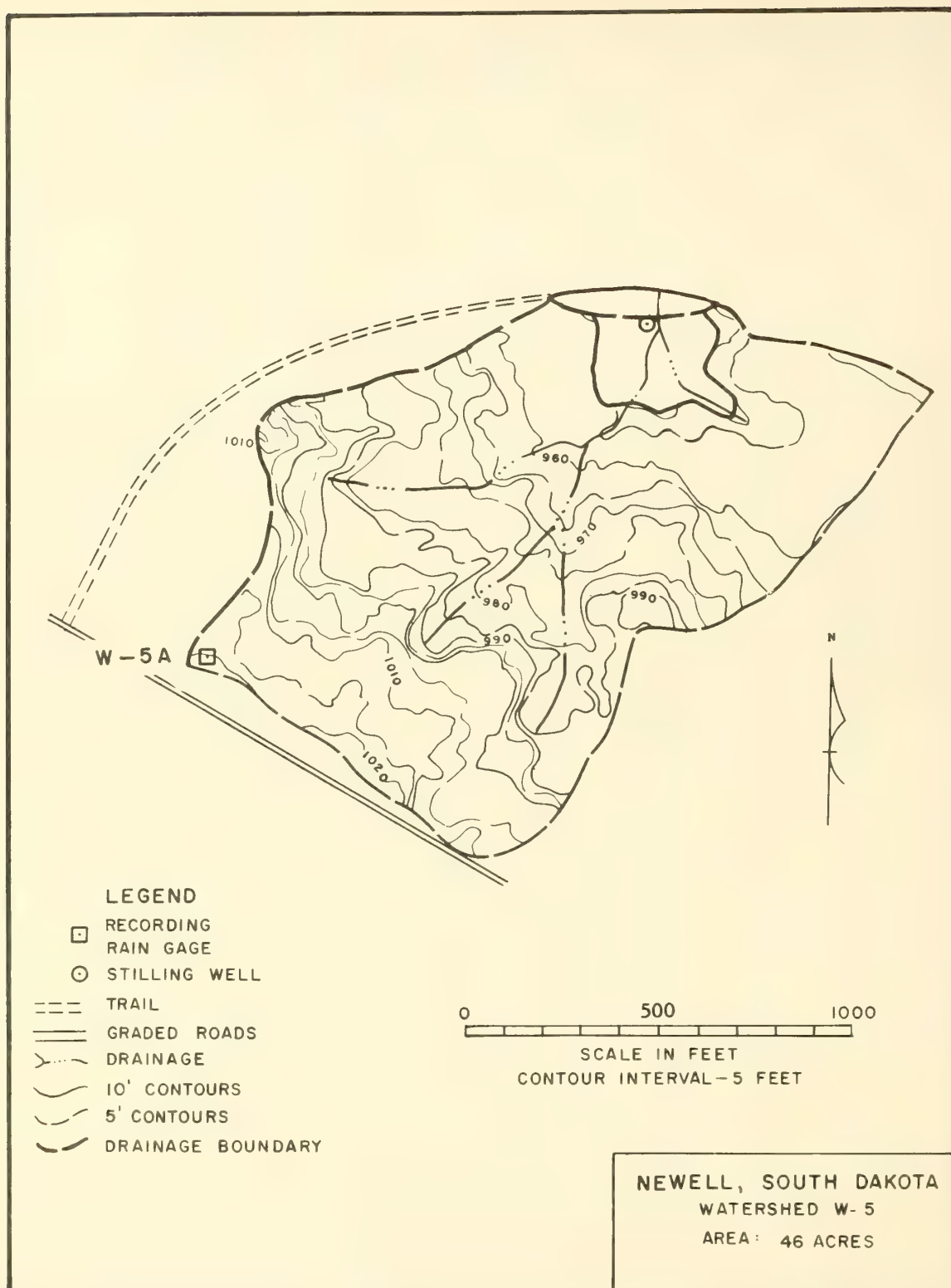
Notes: Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |                      |      | Neveil, South Dakota Watershed W-5 |        |      |               |        |
|-----------------------------------------|---------------|----------------------|------|------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff $\frac{1}{2}$ | Date | Precipitation                      | Runoff | Date | Precipitation | Runoff |
| 1958                                    |               |                      | 1959 |                                    |        |      |               |        |
| 1-26 $\frac{2}{2}$                      | 0.01          | 0                    | 1-13 | 0.06                               | 0      |      |               |        |
| 1-30                                    | .09           | 0                    | 1-15 | .10                                | 0      |      |               |        |
| 1-31                                    | .01           | 0                    | 1-19 | .05                                | 0      |      |               |        |
| 2-15                                    | .05           | 0                    | 1-24 | .03                                | 0      |      |               |        |
| 2-16                                    | .01           | 0                    | 1-29 | .03                                | 0      |      |               |        |
| 2-17                                    | .01           | 0                    | 2-3  | .01                                | 0      |      |               |        |
| 2-25                                    | .18           | 0                    | 2-4  | .01                                | 0      |      |               |        |
| 2-26                                    | .17           | 0                    | 2-5  | .01                                | 0      |      |               |        |
| 2-27                                    | .10           | 0                    | 2-9  | .01                                | 0      |      |               |        |
| 3-8                                     | .01           | 0                    | 2-13 | .06                                | 0      |      |               |        |
| 3-9                                     | .04           | 0                    | 2-17 | .03                                | 0      |      |               |        |
| 3-10                                    | .04           | 0                    | 2-26 | .09                                | 0      |      |               |        |
| 3-17                                    | 0             | .003                 | 3-9  | .09                                | 0      |      |               |        |
| 3-18                                    | 0             | .020                 | 3-11 | 0                                  | .108   |      |               |        |
| 3-25                                    | .04           | 0                    | 3-12 | 0                                  | .104   |      |               |        |
| 3-26                                    | .04           | 0                    | 3-13 | .06                                | 0      |      |               |        |
| 3-31                                    | .40           | 0                    | 3-14 | .01                                | 0      |      |               |        |
| 4-1                                     | .49           | 0                    | 3-15 | .01                                | 0      |      |               |        |
| 4-4                                     | .05           | 0                    | 3-16 | 0                                  | .001   |      |               |        |
| 4-5                                     | .09           | 0                    | 3-18 | 0                                  | .014   |      |               |        |
| 4-6                                     | .01           | 0                    | 3-19 | .04                                | 0      |      |               |        |
| 4-20                                    | .10           | 0                    | 4-2  | .02                                | 0      |      |               |        |
| 4-22                                    | .23           | 0                    | 4-7  | .02                                | 0      |      |               |        |
| 4-25                                    | .07           | 0                    | 4-15 | .10                                | 0      |      |               |        |
| 4-26                                    | .05           | 0                    | 4-16 | .12                                | 0      |      |               |        |
| 4-27                                    | .46           | .029                 | 4-18 | .03                                | 0      |      |               |        |
| 4-28                                    | .02           | 0                    | 4-19 | .04                                | 0      |      |               |        |
| 5-21                                    | .08           | 0                    | 4-22 | 0                                  | .010   |      |               |        |
| 5-23                                    | .15           | 0                    | 4-23 | .04                                | 0      |      |               |        |
| 5-29                                    | .05           | 0                    | 4-25 | .05                                | 0      |      |               |        |
| 5-30                                    | .04           | 0                    | 5-4  | .16                                | 0      |      |               |        |
| 5-31                                    | .10           | 0                    | 5-10 | .16                                | 0      |      |               |        |
| 6-1 $\frac{3}{2}$                       | .06           | 0                    | 5-19 | .22                                | 0      |      |               |        |
| 6-2                                     | .46           | 0                    | 5-20 | .26                                | 0      |      |               |        |
| 6-3                                     | .29           | 0                    | 5-21 | .17                                | 0      |      |               |        |
| 6-7                                     | .58           | .003                 | 5-27 | .15                                | 0      |      |               |        |
| 6-8                                     | .12           | 0                    | 5-28 | .08                                | 0      |      |               |        |
| 6-9                                     | .26           | 0                    | 5-29 | .35                                | 0      |      |               |        |
| 6-11                                    | .23           | 0                    | 5-30 | .64                                | .009   |      |               |        |
| 6-12                                    | .39           | T                    | 5-31 | .12                                | .003   |      |               |        |
| 6-13                                    | .58           | .031                 | 6-1  | .02                                | 0      |      |               |        |
| 7-1                                     | .08           | 0                    | 6-9  | .02                                | 0      |      |               |        |
| 7-2                                     | 1.75          | .201                 | 6-15 | .18                                | 0      |      |               |        |
| 7-3                                     | .05           | 0                    | 6-17 | .10                                | 0      |      |               |        |
| 7-10                                    | .80           | T                    | 6-24 | .28                                | 0      |      |               |        |
| 7-14                                    | .18           | 0                    | 6-25 | .62                                | .007   |      |               |        |
| 7-19                                    | .25           | 0                    | 6-26 | .19                                | 0      |      |               |        |
| 7-29                                    | .31           | 0                    | 6-29 | .20                                | 0      |      |               |        |
| 7-30                                    | .14           | 0                    | 6-30 | .57                                | .013   |      |               |        |
| 8-2                                     | .01           | 0                    | 7-3  | .10                                | 0      |      |               |        |
| 8-3                                     | .03           | 0                    | 7-7  | .05                                | 0      |      |               |        |
| 8-5                                     | .01           | 0                    | 7-15 | .10                                | 0      |      |               |        |
| 8-29                                    | .90           | .007                 | 7-17 | .06                                | 0      |      |               |        |
| 8-30                                    | .02           | 0                    | 8-1  | .12                                | 0      |      |               |        |
| 9-4                                     | .15           | 0                    | 8-5  | .06                                | 0      |      |               |        |
| 9-24                                    | .01           | 0                    | 8-8  | .10                                | 0      |      |               |        |
| 10-8                                    | .02           | 0                    | 8-12 | .04                                | 0      |      |               |        |
| 10-20                                   | .08           | 0                    | 8-24 | .12                                | 0      |      |               |        |
| 10-21                                   | .05           | 0                    | 8-31 | .10                                | 0      |      |               |        |
| 10-28                                   | .03           | 0                    | 9-16 | .25                                | 0      |      |               |        |
| 11-14                                   | .05           | 0                    | 9-17 | .37                                | 0      |      |               |        |
| 11-15                                   | .03           | 0                    | 9-18 | .07                                | 0      |      |               |        |
| 11-16                                   | .10           | 0                    | 9-21 | .18                                | 0      |      |               |        |
| 11-23                                   | .02           | 0                    | 9-24 | .05                                | 0      |      |               |        |
| 12-6                                    | .06           | 0                    | 9-25 | .47                                | 0      |      |               |        |

Notes:  $\frac{1}{2}$  Runoff based on weekly observations prior to 6-1-58.  $\frac{2}{2}$  Observations started.  $\frac{3}{2}$  Stage recorder started. Months of Jan., Feb., Mar., Apr., Nov., and Dec. include snow and snow melt. Quality of records: Precip: Good; Runoff: Good, except for period before 6-1-58 and early snow melt, which are fair.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       | Newell, South Dakota Watershed K-5 |        |      |               |        |
|-----------------------------------------|---------------|--------|-------|------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation                      | Runoff | Date | Precipitation | Runoff |
| 1958                                    |               |        | 1959  |                                    |        |      |               |        |
| 12-7                                    | 0.02          | 0      | 9-27  | 0.02                               | 0      |      |               |        |
| 12-8                                    | .01           | 0      | 9-28  | .02                                | 0      |      |               |        |
| 12-11                                   | .11           | 0      | 9-29  | .01                                | 0      |      |               |        |
| 12-13                                   | .03           | 0      | 10-7  | .10                                | 0      |      |               |        |
| 12-14                                   | .01           | 0      | 10-9  | .29                                | 0      |      |               |        |
|                                         |               |        | 11-1  | .05                                | 0      |      |               |        |
|                                         |               |        | 11-11 | .06                                | 0      |      |               |        |
|                                         |               |        | 11-12 | .07                                | 0      |      |               |        |
|                                         |               |        | 11-21 | .02                                | 0      |      |               |        |
|                                         |               |        | 11-22 | .02                                | 0      |      |               |        |
|                                         |               |        | 11-23 | .21                                | 0      |      |               |        |
|                                         |               |        | 12-3  | .01                                | 0      |      |               |        |
|                                         |               |        | 12-1  | .02                                | 0      |      |               |        |
|                                         |               |        | 12-19 | .01                                | 0      |      |               |        |
|                                         |               |        | 12-20 | .01                                | 0      |      |               |        |
|                                         |               |        | 12-21 | .02                                | 0      |      |               |        |
|                                         |               |        | 12-26 | .02                                | 0      |      |               |        |
|                                         |               |        | 12-27 | .03                                | 0      |      |               |        |
|                                         |               |        | 12-28 | .06                                | 0      |      |               |        |
|                                         |               |        | 12-29 | .02                                | 0      |      |               |        |
|                                         |               |        | 12-31 | .02                                | 0      |      |               |        |
| Notes:                                  |               |        |       |                                    |        |      |               |        |





AREA: 1. Acres.

1. The present study is a part of a larger project on the effects of the 1997-1998 El Niño on the environment and society in the Pacific region.

2007年12月15日 星期一

10. 11. 1957

[illegible]

THE UNIVERSITY OF CHICAGO

[illegible]

STAFF PLANT: 'Moderately all' raised; increase length 10'; number being 10' in grassy area.

DATE: 10-10-1961, 10:00 AM

1. Precipitation: Trace; 2-1/2 inches recorded at station; 1 inch at dam; no recording at E. Early precipitation records from 1 in. gauge on Earl Ruby ranch 2 miles south of dam.

[illegible]

Two hundred and fifty years ago,

Temperature: Temp. = 100; Humidity = 100; Pressure = 100; Wind speed = 100; Wind direction = 100; Rain = 100.

SE: Degree of grazing of rangeland) 1957 moderate; 1958 - moderate; 1959 - moderate.

GENERAL COMMENTS: The oil and gas basins in Eastern-Northern and Central Plains and Badland Basins, west Sakotas; especially in the Pierre shale in Badland Basin and Pierre shale in Pierre shale basins. Pierre shale basins and Badland basins are the main land resource area (G-60).

Notes: Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.  
1/ Precipitation prior to 6-11-58 from Carl Ruby ranch gage.

| DAILY PRECIPITATION AND RUNOFF (Inches) |                         |                  |      | Newell, South Dakota Watershed W-6 |        |      |               |        |
|-----------------------------------------|-------------------------|------------------|------|------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation <u>1/</u> | Runoff <u>2/</u> | Date | Precipitation                      | Runoff | Date | Precipitation | Runoff |
| 1958                                    |                         |                  | 1959 |                                    |        |      |               |        |
| 1-26 <u>3/</u>                          | 0.01                    | 0                | 1-6  | 0.06                               | 0      |      |               |        |
| 1-31                                    | .13                     | 0                | 1-13 | .06                                | 0      |      |               |        |
| 2-14                                    | .02                     | 0                | 1-15 | .06                                | 0      |      |               |        |
| 2-24                                    | 0                       | .030 <u>4/</u>   | 1-16 | .07                                | 0      |      |               |        |
| 2-25                                    | .22                     | 0                | 1-19 | .07                                | 0      |      |               |        |
| 2-26                                    | .08                     | 0                | 1-24 | .01                                | 0      |      |               |        |
| 3-8                                     | .07                     | 0                | 1-25 | .01                                | 0      |      |               |        |
| 3-25                                    | .02                     | 0                | 1-29 | .04                                | 0      |      |               |        |
| 3-26                                    | .08                     | 0                | 1-30 | .10                                | 0      |      |               |        |
| 3-27                                    | .02                     | 0                | 2-3  | .01                                | 0      |      |               |        |
| 3-31                                    | .45                     | e .060 <u>4/</u> | 2-4  | .02                                | 0      |      |               |        |
| 4-1                                     | .31                     | e .060 <u>4/</u> | 2-5  | .01                                | 0      |      |               |        |
| 4-5                                     | .18                     | 0                | 2-9  | .01                                | 0      |      |               |        |
| 4-20                                    | .11                     | 0                | 2-13 | .23                                | .003   |      |               |        |
| 4-22                                    | .39                     | 0                | 2-16 | .05                                | 0      |      |               |        |
| 4-23                                    | .01                     | 0                | 2-17 | .05                                | 0      |      |               |        |
| 4-25                                    | .10                     | 0                | 2-26 | .09                                | 0      |      |               |        |
| 4-26                                    | .12                     | 0                | 3-9  | .08                                | 0      |      |               |        |
| 4-27                                    | .61                     | 0                | 3-11 | 0                                  | .263   |      |               |        |
| 4-29                                    | 0                       | .222             | 3-12 | .01                                | 0      |      |               |        |
| 5-20                                    | .02                     | 0                | 3-13 | .02                                | 0      |      |               |        |
| 5-21                                    | .18                     | 0                | 3-14 | .01                                | 0      |      |               |        |
| 5-25                                    | .60                     | 0                | 3-15 | .02                                | .121   |      |               |        |
| 5-27                                    | 0                       | 0                | 3-16 | T                                  | .002   |      |               |        |
| 5-28                                    | .05                     | 0                | 3-17 | 0                                  | .015   |      |               |        |
| 5-29                                    | .24                     | 0                | 3-19 | .01                                | 0      |      |               |        |
| 5-30                                    | .14                     | 0                | 3-20 | .02                                | 0      |      |               |        |
| 5-31                                    | .06                     | 0                | 3-24 | .01                                | 0      |      |               |        |
| 6-2                                     | .15                     | 0                | 4-2  | .03                                | 0      |      |               |        |
| 6-3                                     | .55                     | .084 <u>4/</u>   | 4-15 | .10                                | 0      |      |               |        |
| 6-7                                     | .20                     | 0                | 4-16 | .14                                | 0      |      |               |        |
| 6-8                                     | .10                     | 0                | 4-18 | .10                                | 0      |      |               |        |
| 6-9                                     | .10                     | 0                | 4-19 | .07                                | .002   |      |               |        |
| 6-11                                    | .05                     | 0                | 4-20 | .04                                | 0      |      |               |        |
| 6-12                                    | .37                     | 0                | 4-22 | 0                                  | .025   |      |               |        |
| 6-13                                    | .08                     | 0                | 4-23 | .10                                | 0      |      |               |        |
| 6-14                                    | .42                     | 0                | 5-4  | .15                                | 0      |      |               |        |
| 6-15                                    | .06                     | 0                | 5-5  | .03                                | 0      |      |               |        |
| 6-16                                    | 0                       | .014 <u>4/</u>   | 5-10 | .23                                | 0      |      |               |        |
| 6-17 <u>5/</u>                          | 0                       | 0                | 5-19 | .08                                | 0      |      |               |        |
| 6-23                                    | 0                       | 0                | 5-20 | .26                                | 0      |      |               |        |
| 7-1                                     | .20                     | 0                | 5-21 | .08                                | 0      |      |               |        |
| 7-2                                     | 1.62                    | .218             | 5-27 | .18                                | 0      |      |               |        |
| 7-3                                     | .04                     | 0                | 5-28 | .08                                | 0      |      |               |        |
| 7-10                                    | .93                     | .099             | 5-29 | .29                                | 0      |      |               |        |
| 7-14                                    | .12                     | 0                | 5-30 | .71                                | .064   |      |               |        |
| 7-19                                    | .20                     | 0                | 5-31 | .50                                | .051   |      |               |        |
| 7-29                                    | .21                     | 0                | 6-1  | 0                                  | 0      |      |               |        |
| 7-30                                    | .17                     | T                | 6-7  | .09                                | 0      |      |               |        |
| 8-2                                     | .08                     | 0                | 6-15 | .22                                | 0      |      |               |        |
| 8-5                                     | 0                       | 0                | 6-16 | 0                                  | .003   |      |               |        |
| 8-12                                    | 0                       | 0                | 6-17 | .34                                | .003   |      |               |        |
| 8-18                                    | 0                       | 0                | 6-24 | .57                                | .061   |      |               |        |
| 8-23                                    | 0                       | 0                | 6-25 | .50                                | .034   |      |               |        |
| 8-29                                    | .61                     | 0                | 6-26 | .28                                | 0      |      |               |        |
| 8-30                                    | .23                     | .009             | 6-29 | .03                                | 0      |      |               |        |
| 8-31                                    | .01                     | 0                | 6-30 | .88                                | .075   |      |               |        |
| 9-17                                    | .04                     | 0                | 7-1  | .01                                | 0      |      |               |        |
| 10-8                                    | .07                     | 0                | 7-3  | .10                                | 0      |      |               |        |
| 10-20                                   | .08                     | 0                | 7-7  | .28                                | 0      |      |               |        |
| 10-21                                   | .12                     | 0                | 7-13 | .37                                | 0      |      |               |        |
| 11-14                                   | .11                     | 0                | 7-15 | .63                                | .006   |      |               |        |
| 11-15                                   | .06                     | 0                | 7-21 | .02                                | 0      |      |               |        |
| 11-16                                   | .11                     | 0                | 8-12 | .14                                | 0      |      |               |        |
| 11-17                                   | .13                     | 0                | 8-24 | .09                                | 0      |      |               |        |

Notes: 1/ Precipitation prior to 6-11-58 from Carl Ruby page. 2/ Runoff based on weekly observations prior to 6-17-58. 3/ Start of observations. 4/ Runoff between observation dates. 5/ Stage recorder installed. Months of Jan., Feb., Mar., Apr., Nov., and Dec. include snow and snow melt. Quality of records: Precipitation and runoff - good, except for period before 6-17-58 and early snow melt, which are fair.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        | Newell, South Dakota Watershed W-6 |               |        |      |               |        |
|-----------------------------------------|---------------|--------|------------------------------------|---------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date                               | Precipitation | Runoff | Date | Precipitation | Runoff |
| 1958                                    |               |        | 1959                               |               |        |      |               |        |
| 11-23                                   | 0.02          | 0      | 8-31                               | 0.46          | 0      |      |               |        |
| 12-6                                    | .11           | 0      | 9-16                               | .45           | 0      |      |               |        |
| 12-7                                    | .03           | 0      | 9-17                               | .34           | T      |      |               |        |
| 12-11                                   | .10           | 0      | 9-18                               | .07           | 0      |      |               |        |
| 12-13                                   | .08           | 0      | 9-19                               | .02           | 0      |      |               |        |
| 12-14                                   | .01           | 0      | 9-21                               | .11           | 0      |      |               |        |
|                                         |               |        | 9-24                               | .13           | 0      |      |               |        |
|                                         |               |        | 9-25                               | .28           | 0      |      |               |        |
|                                         |               |        | 9-27                               | .05           | 0      |      |               |        |
|                                         |               |        | 9-28                               | .02           | 0      |      |               |        |
|                                         |               |        | 9-29                               | .01           | 0      |      |               |        |
|                                         |               |        | 10-1                               | .02           | 0      |      |               |        |
|                                         |               |        | 10-7                               | .18           | 0      |      |               |        |
|                                         |               |        | 10-9                               | .24           | 0      |      |               |        |
|                                         |               |        | 10-12                              | .09           | 0      |      |               |        |
|                                         |               |        | 10-22                              | .03           | 0      |      |               |        |
|                                         |               |        | 11-4                               | .11           | T      |      |               |        |
|                                         |               |        | 11-6                               | 0             | T      |      |               |        |
|                                         |               |        | 11-11                              | .03           | 0      |      |               |        |
|                                         |               |        | 11-12                              | .06           | 0      |      |               |        |
|                                         |               |        | 11-13                              | .01           | 0      |      |               |        |
|                                         |               |        | 11-15                              | .03           | 0      |      |               |        |
|                                         |               |        | 11-21                              | .01           | 0      |      |               |        |
|                                         |               |        | 11-22                              | .02           | 0      |      |               |        |
|                                         |               |        | 11-23                              | .16           | 0      |      |               |        |
|                                         |               |        | 11-25                              | .01           | 0      |      |               |        |
|                                         |               |        | 12-1                               | T             | T      |      |               |        |
|                                         |               |        | 12-3                               | .01           | 0      |      |               |        |
|                                         |               |        | 12-4                               | .01           | 0      |      |               |        |
|                                         |               |        | 12-20                              | .01           | 0      |      |               |        |
|                                         |               |        | 12-21                              | .01           | 0      |      |               |        |
|                                         |               |        | 12-27                              | .03           | 0      |      |               |        |
|                                         |               |        | 12-31                              | .10           | 0      |      |               |        |
| Notes:                                  |               |        |                                    |               |        |      |               |        |







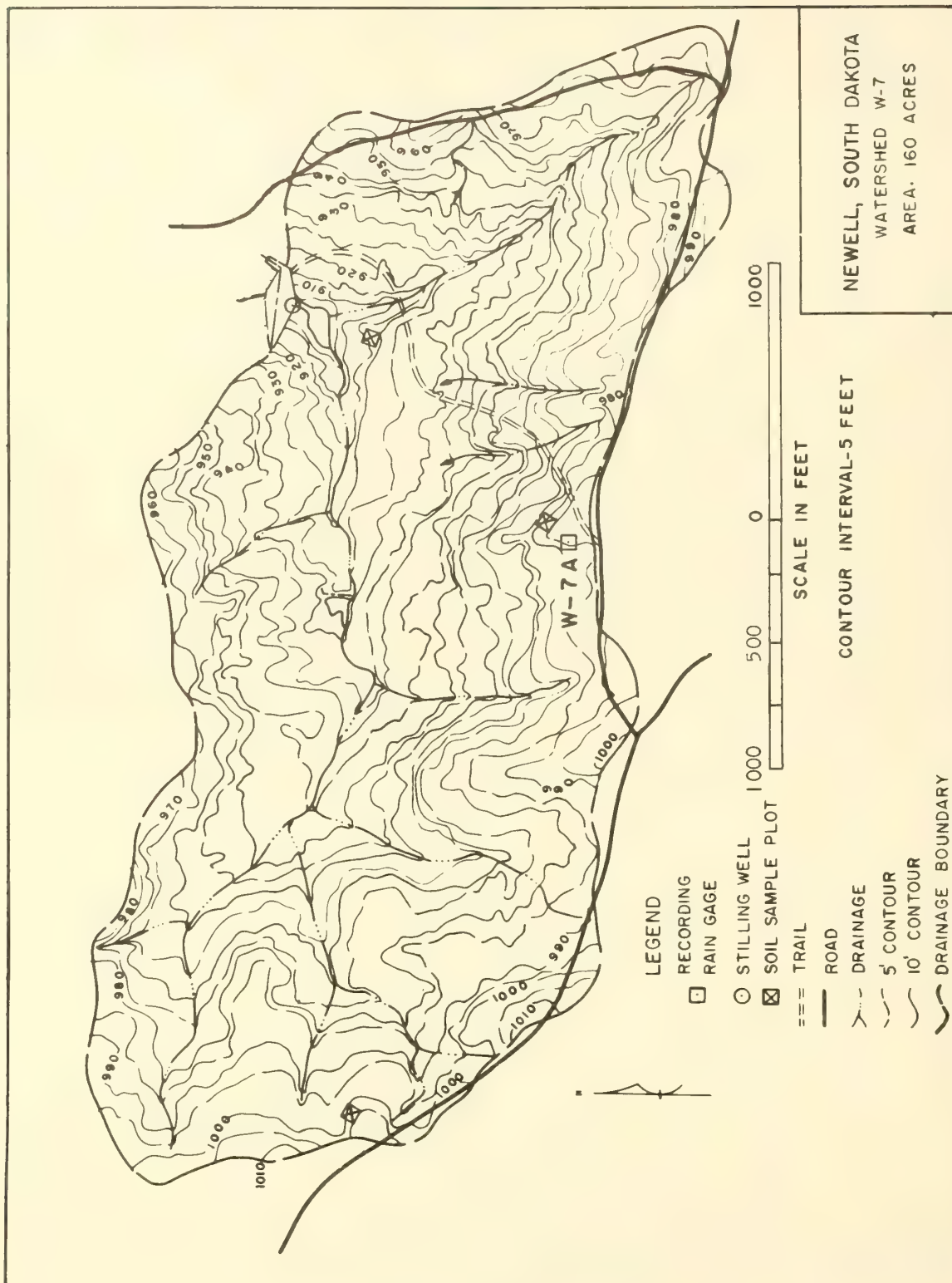
| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |      |               |        | Neveall, South Dakota Watershed W-7 |               |        |
|-----------------------------------------|---------------|--------|------|---------------|--------|-------------------------------------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date | Precipitation | Runoff | Date                                | Precipitation | Runoff |
| 1958                                    |               |        | 1959 |               |        |                                     |               |        |
| 1-26 <sup>1/</sup>                      | 0.01          | 0      | 1-1  | 0.03          | 0      |                                     |               |        |
| 1-30                                    | .09           | 0      | 1-13 | .06           | 0      |                                     |               |        |
| 1-31                                    | .01           | 0      | 1-15 | .03           | 0      |                                     |               |        |
| 2-15                                    | .05           | 0      | 1-16 | .10           | 0      |                                     |               |        |
| 2-16                                    | .01           | 0      | 1-21 | .01           | 0      |                                     |               |        |
| 2-17                                    | .01           | 0      | 1-25 | .01           | 0      |                                     |               |        |
| 2-25                                    | .18           | 0      | 1-30 | .01           | 0      |                                     |               |        |
| 2-26                                    | .17           | 0      | 2-3  | .01           | 0      |                                     |               |        |
| 2-27                                    | .10           | 0      | 2-11 | .01           | 0      |                                     |               |        |
| 3-8 <sup>2/</sup>                       | .01           | 0      | 2-5  | .01           | 0      |                                     |               |        |
| 3-9                                     | .01           | 0      | 2-9  | .03           | 0      |                                     |               |        |
| 3-10                                    | .01           | 0      | 2-13 | .10           | 0      |                                     |               |        |
| 3-25                                    | .01           | 0      | 2-16 | .08           | 0      |                                     |               |        |
| 3-26                                    | .01           | 0      | 2-17 | .03           | 0      |                                     |               |        |
| 3-31                                    | .10           | T      | 2-26 | .09           | 0      |                                     |               |        |
| 4-1                                     | .19           | 0      | 3-9  | .08           | 0      |                                     |               |        |
| 4-11                                    | .05           | 0      | 3-11 | 0             | .055   |                                     |               |        |
| 4-15                                    | .09           | 0      | 3-12 | T             | .091   |                                     |               |        |
| 4-16                                    | .01           | 0      | 3-13 | .05           | .029   |                                     |               |        |
| 4-20                                    | .10           | 0      | 3-14 | .02           | 0      |                                     |               |        |
| 4-22                                    | .23           | 0      | 3-15 | .06           | 0      |                                     |               |        |
| 4-25                                    | .07           | 0      | 3-17 | T             | .031   |                                     |               |        |
| 4-26                                    | .05           | 0      | 3-19 | .07           | 0      |                                     |               |        |
| 4-27                                    | .16           | 0      | 3-20 | .01           | 0      |                                     |               |        |
| 4-28                                    | .02           | 0      | 4-2  | .02           | 0      |                                     |               |        |
| 5-21                                    | .08           | 0      | 4-7  | .02           | 0      |                                     |               |        |
| 5-23                                    | .15           | 0      | 4-15 | .10           | 0      |                                     |               |        |
| 5-29                                    | .09           | 0      | 4-16 | .14           | 0      |                                     |               |        |
| 5-30                                    | .01           | 0      | 4-18 | .12           | 0      |                                     |               |        |
| 5-31                                    | .10           | 0      | 4-19 | .08           | 0      |                                     |               |        |
| 6-1                                     | .01           | 0      | 4-23 | .08           | 0      |                                     |               |        |
| 6-2                                     | .10           | 0      | 5-1  | .20           | 0      |                                     |               |        |
| 6-3                                     | .12           | T      | 5-5  | .02           | 0      |                                     |               |        |
| 6-7                                     | .66           | 0      | 5-10 | .20           | 0      |                                     |               |        |
| 6-8                                     | .07           | 0      | 5-19 | .08           | 0      |                                     |               |        |
| 6-9                                     | .11           | 0      | 5-20 | .39           | 0      |                                     |               |        |
| 6-11                                    | .36           | 0      | 5-21 | .13           | 0      |                                     |               |        |
| 6-12                                    | .19           | T      | 5-27 | .15           | 0      |                                     |               |        |
| 6-13                                    | .64           | .005   | 5-28 | .11           | 0      |                                     |               |        |
| 7-1                                     | .01           | 0      | 5-29 | .35           | 0      |                                     |               |        |
| 7-2                                     | 1.67          | .211   | 5-30 | .51           | T      |                                     |               |        |
| 7-3                                     | .02           | .002   | 5-31 | .16           | 0      |                                     |               |        |
| 7-10                                    | .15           | 0      | 6-6  | .05           | 0      |                                     |               |        |
| 7-11                                    | .15           | 0      | 6-15 | .20           | 0      |                                     |               |        |
| 7-16                                    | .12           | 0      | 6-16 | .02           | 0      |                                     |               |        |
| 7-17                                    | .02           | 0      | 6-17 | .12           | 0      |                                     |               |        |
| 7-18                                    | .11           | 0      | 6-21 | .07           | 0      |                                     |               |        |
| 7-19                                    | .19           | 0      | 6-24 | .26           | 0      |                                     |               |        |
| 7-21                                    | .01           | 0      | 6-25 | .70           | T      |                                     |               |        |
| 7-29                                    | .20           | 0      | 6-26 | .21           | 0      |                                     |               |        |
| 7-30                                    | .10           | 0      | 6-29 | .07           | 0      |                                     |               |        |
| 8-2                                     | .01           | 0      | 6-30 | .77           | .002   |                                     |               |        |
| 8-3                                     | .03           | 0      | 7-1  | .13           | 0      |                                     |               |        |
| 8-5                                     | .05           | 0      | 7-7  | .08           | 0      |                                     |               |        |
| 8-29                                    | .51           | T      | 7-15 | .17           | 0      |                                     |               |        |
| 8-30                                    | .11           | T      | 7-17 | .02           | 0      |                                     |               |        |
| 9-11                                    | .20           | 0      | 8-1  | .21           | 0      |                                     |               |        |
| 9-21                                    | .01           | 0      | 8-5  | .13           | 0      |                                     |               |        |
| 10-8                                    | .07           | 0      | 8-8  | .15           | 0      |                                     |               |        |
| 10-20                                   | .07           | 0      | 8-12 | .08           | 0      |                                     |               |        |
| 10-21                                   | .11           | 0      | 8-22 | .01           | 0      |                                     |               |        |
| 11-11                                   | .13           | 0      | 8-23 | .02           | 0      |                                     |               |        |
| 11-15                                   | .05           | 0      | 8-24 | .18           | 0      |                                     |               |        |
| 11-16                                   | .11           | 0      | 8-31 | .02           | 0      |                                     |               |        |
| 11-23                                   | .07           | 0      | 9-16 | .36           | 0      |                                     |               |        |

Notes: Quality of records: Precipitation - good. Runoff - good except for period during early snow melt which is fair. Months of Jan., Feb., Mar., Apr., May, and Dec. include snow and snow melt.  
<sup>1/</sup> Start of observations and rain gauge installed. <sup>2/</sup> Stage recorder installed.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       |               |        | Newell, South Dakota Watershed M-7 |               |        |
|-----------------------------------------|---------------|--------|-------|---------------|--------|------------------------------------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation | Runoff | Date                               | Precipitation | Runoff |
| 1958                                    |               |        | 1959  |               |        |                                    |               |        |
| 10-6                                    | 0.10          | 0      | 9-17  | 0.37          | 0.002  |                                    |               |        |
| 10-7                                    | .06           | 0      | 9-18  | .07           | 0      |                                    |               |        |
| 10-11                                   | .10           | 0      | 9-19  | .01           | 0      |                                    |               |        |
| 10-12                                   | .07           | 0      | 9-21  | .10           | 0      |                                    |               |        |
| 10-13                                   | .01           | 0      | 9-22  | .22           | T      |                                    |               |        |
|                                         |               |        | 9-25  | .37           | .002   |                                    |               |        |
|                                         |               |        | 9-27  | .01           | 0      |                                    |               |        |
|                                         |               |        | 9-28  | .01           | 0      |                                    |               |        |
|                                         |               |        | 9-29  | .01           | 0      |                                    |               |        |
|                                         |               |        | 10-1  | .02           | 0      |                                    |               |        |
|                                         |               |        | 10-7  | .16           | 0      |                                    |               |        |
|                                         |               |        | 10-8  | .06           | 0      |                                    |               |        |
|                                         |               |        | 10-12 | .07           | 0      |                                    |               |        |
|                                         |               |        | 10-15 | .02           | 0      |                                    |               |        |
|                                         |               |        | 10-16 | .06           | 0      |                                    |               |        |
|                                         |               |        | 11-6  | .03           | 0      |                                    |               |        |
|                                         |               |        | 11-9  | .09           | 0      |                                    |               |        |
|                                         |               |        | 11-11 | .02           | 0      |                                    |               |        |
|                                         |               |        | 11-12 | .02           | 0      |                                    |               |        |
|                                         |               |        | 11-17 | .02           | 0      |                                    |               |        |
|                                         |               |        | 11-1  | .01           | 0      |                                    |               |        |
|                                         |               |        | 11-21 | .06           | 0      |                                    |               |        |
|                                         |               |        | 11-22 | .02           | 0      |                                    |               |        |
|                                         |               |        | 11-23 | .21           | 0      |                                    |               |        |
|                                         |               |        | 12-3  | .01           | 0      |                                    |               |        |
|                                         |               |        | 12-4  | .06           | 0      |                                    |               |        |
|                                         |               |        | 12-12 | .07           | 0      |                                    |               |        |
|                                         |               |        | 12-13 | .01           | 0      |                                    |               |        |
|                                         |               |        | 12-20 | .06           | 0      |                                    |               |        |
|                                         |               |        | 12-21 | .06           | 0      |                                    |               |        |
|                                         |               |        | 12-26 | .02           | 0      |                                    |               |        |
|                                         |               |        | 12-27 | .06           | 0      |                                    |               |        |
|                                         |               |        | 12-28 | .02           | 0      |                                    |               |        |
|                                         |               |        | 12-29 | .02           | 0      |                                    |               |        |

Notes:





*[Faint, illegible handwritten notes]*

$\frac{d}{dt} \left( \frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$

1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 26

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species -

1957: Degree of grazing of rangeland 1957 - full; 1958 - full; 1959 - close.

area. (G-6C)

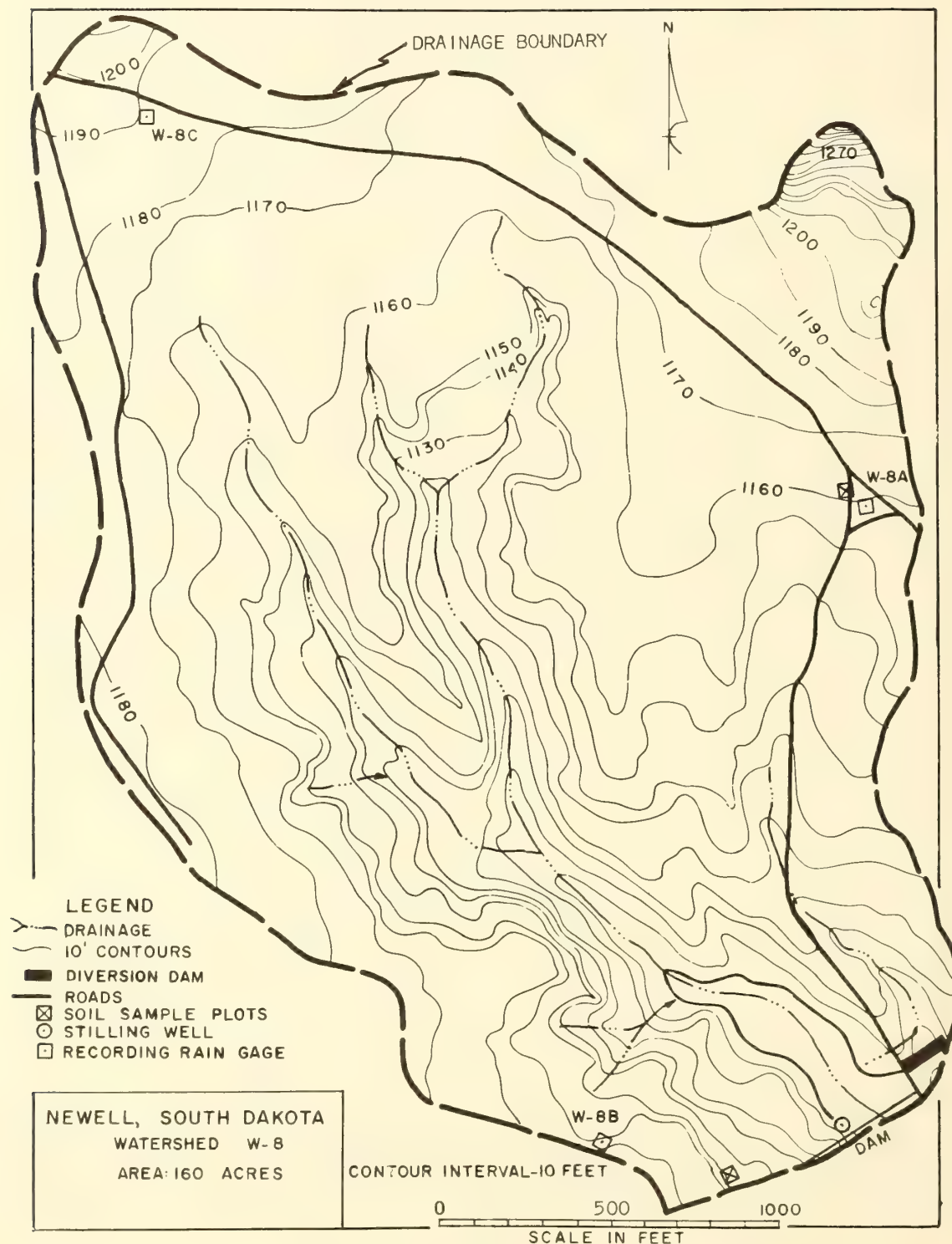
Notes: Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.  
1/ Precipitation Thiessen weighted from two rain gauges after 8-1-59.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |                      |         |               |                      | Newell, South Dakota Watershed W-8 |               |        |
|-----------------------------------------|---------------|----------------------|---------|---------------|----------------------|------------------------------------|---------------|--------|
| Date                                    | Precipitation | Runoff $\frac{1}{2}$ | Date    | Precipitation | Runoff $\frac{1}{2}$ | Date                               | Precipitation | Runoff |
| 1958                                    |               |                      | 1959    |               |                      |                                    |               |        |
| 1-13 2/                                 | 0.0           | 0.005 $\frac{1}{2}$  | 1-1     | 0.01          | 0.0                  |                                    |               |        |
| 1-29                                    | .01           | 0                    | 1-6     | .06           | 0                    |                                    |               |        |
| 1-30 2/                                 | .11           | 0                    | 1-13    | .06           | 0                    |                                    |               |        |
| 1-31                                    | .03           | 0                    | 1-15    | .02           | 0                    |                                    |               |        |
| 2-15                                    | .01           | 0                    | 1-29    | .07           | 0                    |                                    |               |        |
| 2-21                                    | 0             | .009 $\frac{1}{2}$   | 1-30    | .07           | 0                    |                                    |               |        |
| 2-25                                    | .26           | 0                    | 2-5     | .03           | 0                    |                                    |               |        |
| 2-26                                    | .10           | 0                    | 2-9     | .01           | 0                    |                                    |               |        |
| 2-11                                    | 0             | .005 $\frac{1}{2}$   | 2-13    | .04           | 0                    |                                    |               |        |
| 3-8                                     | .05           | 0                    | 2-17    | .05           | 0                    |                                    |               |        |
| 3-21                                    | 0             | .003 $\frac{1}{2}$   | 2-26    | .06           | 0                    |                                    |               |        |
| 3-26, 27                                | .60           | .003 $\frac{1}{2}$   | 2-28 5/ | 0             | .002 $\frac{1}{2}$   |                                    |               |        |
| 4-5                                     | .35           | 0                    | 3-9     | .01           | 0                    |                                    |               |        |
| 4-20                                    | .01           | 0                    | 3-11    | 0             | .035 $\frac{1}{2}$   |                                    |               |        |
| 4-22                                    | .31           | 0                    | 3-12    | .01           | 0                    |                                    |               |        |
| 4-25                                    | .11           | 0                    | 3-13    | .02           | 0                    |                                    |               |        |
| 4-26                                    | .09           | 0                    | 3-18    | 0             | .124 $\frac{1}{2}$   |                                    |               |        |
| 4-27                                    | .15           | .019                 | 3-20    | .03           | 0                    |                                    |               |        |
| 5-21                                    | .18           | nr                   | 3-27    | 0             | .017 $\frac{1}{2}$   |                                    |               |        |
| 5-29                                    | .31           | nr                   | 4-2     | .02           | 0                    |                                    |               |        |
| 6-2                                     | .58           | nr                   | 4-9     | .01           | 0                    |                                    |               |        |
| 6-3                                     | .56           | nr                   | 4-15    | .20           | .007                 |                                    |               |        |
| 6-7                                     | .99           | nr                   | 4-16    | .28           | .009                 |                                    |               |        |
| 6-8                                     | .31           | nr                   | 4-18    | .10           | 0                    |                                    |               |        |
| 6-9                                     | .75           | nr                   | 4-19    | .14           | .020                 |                                    |               |        |
| 6-12                                    | .76           | nr                   | 4-20    | T             | .007                 |                                    |               |        |
| 6-13                                    | .16           | nr                   | 4-21    | 0             | .002                 |                                    |               |        |
| 6-14                                    | .26           | nr                   | 4-23    | .02           | 0                    |                                    |               |        |
| 6-16                                    | 0             | .030                 | 5-1     | .26           | 0                    |                                    |               |        |
| 6-21                                    | .08           | 0                    | 5-9     | .11           | T                    |                                    |               |        |
| 7-1                                     | 0             | 0                    | 5-10    | .20           | T                    |                                    |               |        |
| 7-2                                     | .03           | .002                 | 5-20    | .54           | 0                    |                                    |               |        |
| 7-12                                    | .19           | nr                   | 5-21    | 0             | 0                    |                                    |               |        |
| 7-14                                    | .50           | nr                   | 5-22    | .53           | .005                 |                                    |               |        |
| 7-31                                    | .15           | nr                   | 5-23    | 0             | 0                    |                                    |               |        |
| 8-2                                     | .12           | nr                   | 5-21    | .16           | 0                    |                                    |               |        |
| 8-3                                     | .06           | 0                    | 5-22    | .06           | 0                    |                                    |               |        |
| 8-20                                    | .72           | nr                   | 5-29    | .17           | 0                    |                                    |               |        |
| 9-13                                    | .01           | 0                    | 5-30    | .67           | .008                 |                                    |               |        |
| 10-20                                   | .21           | nr                   | 5-31    | .37           | 0                    |                                    |               |        |
| 10-21                                   | .05           | 0                    | 6-7     | .03           | 0                    |                                    |               |        |
| 11-14                                   | .16           | nr                   | 6-11    | .06           | 0                    |                                    |               |        |
| 11-23                                   | .02           | 0                    | 6-17    | .01           | 0                    |                                    |               |        |
| 11-26                                   | 0             | .003 $\frac{1}{2}$   | 6-21    | .01           | 0                    |                                    |               |        |
| 12-6                                    | .06           | 0                    | 6-22    | .02           | 0                    |                                    |               |        |
| 12-11                                   | .10           | nr                   | 6-24    | .33           | 0                    |                                    |               |        |
| 12-12                                   | .01           | 0                    | 6-25    | .30           | 0                    |                                    |               |        |
| 12-13                                   | .06           | 0                    | 6-26    | .21           | .002                 |                                    |               |        |
|                                         |               |                      | 6-28    | 0             | 0                    |                                    |               |        |
|                                         |               |                      | 6-29    | .12           | 0                    |                                    |               |        |
|                                         |               |                      | 6-30    | .70           | .003                 |                                    |               |        |
|                                         |               |                      | 7-3     | .13           | .003                 |                                    |               |        |
|                                         |               |                      | 7-7     | .05           | 0                    |                                    |               |        |
|                                         |               |                      | 7-15    | .17           | 0                    |                                    |               |        |
|                                         |               |                      | 7-16    | .05           | 0                    |                                    |               |        |
|                                         |               |                      | 7-17    | .20           | 0                    |                                    |               |        |
|                                         |               |                      | 8-6     | .29           | T                    |                                    |               |        |
|                                         |               |                      | 8-7     | .02           | 0                    |                                    |               |        |
|                                         |               |                      | 8-8     | .02           | 0                    |                                    |               |        |
|                                         |               |                      | 8-11    | .03           | 0                    |                                    |               |        |
|                                         |               |                      | 8-20    | .01           | 0                    |                                    |               |        |
|                                         |               |                      | 9-15    | .02           | 0                    |                                    |               |        |
|                                         |               |                      | 9-16    | .20           | 0                    |                                    |               |        |
|                                         |               |                      | 9-17    | .70           | .002                 |                                    |               |        |
|                                         |               |                      | 9-18    | .06           | 0                    |                                    |               |        |

Notes: Quality of records: Precipitation - good; runoff - good except for period before 2-28-59 which is fair. Months of Jan., Feb., Mar., Apr., May, and Dec. include snow and snow melt. 1/ Runoff based on weekly observations prior to 4-4-59. 2/ Start of observations. 3/ Recording rain gage installed. 4/ Runoff between observation dates. 5/ Stage recorder installed.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       |               |        | Newell, South Dakota Watershed 11-B |               |        |
|-----------------------------------------|---------------|--------|-------|---------------|--------|-------------------------------------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation | Runoff | Date                                | Precipitation | Runoff |
|                                         |               |        | 1959  |               |        |                                     |               |        |
|                                         |               |        | 9-21  | .31           | .004   |                                     |               |        |
|                                         |               |        | 9-24  | .29           | 0      |                                     |               |        |
|                                         |               |        | 9-25  | .51           | .004   |                                     |               |        |
|                                         |               |        | 9-26  | .01           | 0      |                                     |               |        |
|                                         |               |        | 9-27  | .01           | 0      |                                     |               |        |
|                                         |               |        | 9-28  | .01           | 0      |                                     |               |        |
|                                         |               |        | 9-29  | .01           | 0      |                                     |               |        |
|                                         |               |        | 9-30  | .01           | 0      |                                     |               |        |
|                                         |               |        | 10-1  | .01           | 0      |                                     |               |        |
|                                         |               |        | 10-5  | .01           | 0      |                                     |               |        |
|                                         |               |        | 10-7  | .13           | 0      |                                     |               |        |
|                                         |               |        | 10-7  | .32           | .002   |                                     |               |        |
|                                         |               |        | 10-12 | .02           | 0      |                                     |               |        |
|                                         |               |        | 10-22 | .01           | 0      |                                     |               |        |
|                                         |               |        | 10-25 | .03           | 0      |                                     |               |        |
|                                         |               |        | 10-26 | .03           | 0      |                                     |               |        |
|                                         |               |        | 10-31 | .02           | .002   |                                     |               |        |
|                                         |               |        | 11-5  | .28           | 0      |                                     |               |        |
|                                         |               |        | 11-11 | .02           | 0      |                                     |               |        |
|                                         |               |        | 11-12 | .26           | 0      |                                     |               |        |
|                                         |               |        | 11-13 | .06           | 0      |                                     |               |        |
|                                         |               |        | 11-15 | .04           | 0      |                                     |               |        |
|                                         |               |        | 11-16 | .01           | 0      |                                     |               |        |
|                                         |               |        | 11-21 | .02           | 0      |                                     |               |        |
|                                         |               |        | 11-22 | .01           | .002   |                                     |               |        |
|                                         |               |        | 11-23 | .32           | 0      |                                     |               |        |
|                                         |               |        | 11-24 | .01           | 0      |                                     |               |        |
|                                         |               |        | 12-3  | .03           | 0      |                                     |               |        |
|                                         |               |        | 12-4  | .02           | 0      |                                     |               |        |
|                                         |               |        | 12-20 | .03           | 0      |                                     |               |        |
|                                         |               |        | 12-21 | .01           | 0      |                                     |               |        |
|                                         |               |        | 12-22 | .21           | 0      |                                     |               |        |
|                                         |               |        | 12-22 | .01           | 0      |                                     |               |        |
|                                         |               |        | 12-30 | .01           | 0      |                                     |               |        |
| Notes:                                  |               |        |       |               |        |                                     |               |        |





1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

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Early precipitation

10: Degree of grazing of rangeland after grazing only. 1.00 - moderate; 1.00 - none; 1.50 - moderate.

| MONTHLY PRECIPITATION AND RUNOFF (Inches) |      |      |      |      |      |      | Newell, South Dakota - Watershed W-9 |      |       |      |      |       |       |
|-------------------------------------------|------|------|------|------|------|------|--------------------------------------|------|-------|------|------|-------|-------|
| Month<br>Year                             | Jan. | Feb. | Mar. | Apr. | May  | June | July                                 | Aug. | Sept. | Oct. | Nov. | Dec.  | Year  |
| 1958                                      | 0.01 | 0.11 | 0.25 | 1.60 | 0.11 | 0.54 | 2.40                                 | 0.87 | 0.11  | 0.24 | 0.14 | 0.24  | 10.61 |
| 1959                                      | 0.24 | 0.29 | 0.11 | 0.54 | 2.90 | 1.40 | 1.01                                 | 0.11 | 0.21  | 0.11 | 0.29 | 0.19  | 11.20 |
| Normal                                    | 0.37 | 0.14 | 1.67 | 2.65 | 0.96 | 0.11 | 1.34                                 | 1.29 | 1.06  | 0.55 | 0.34 | 15.57 |       |

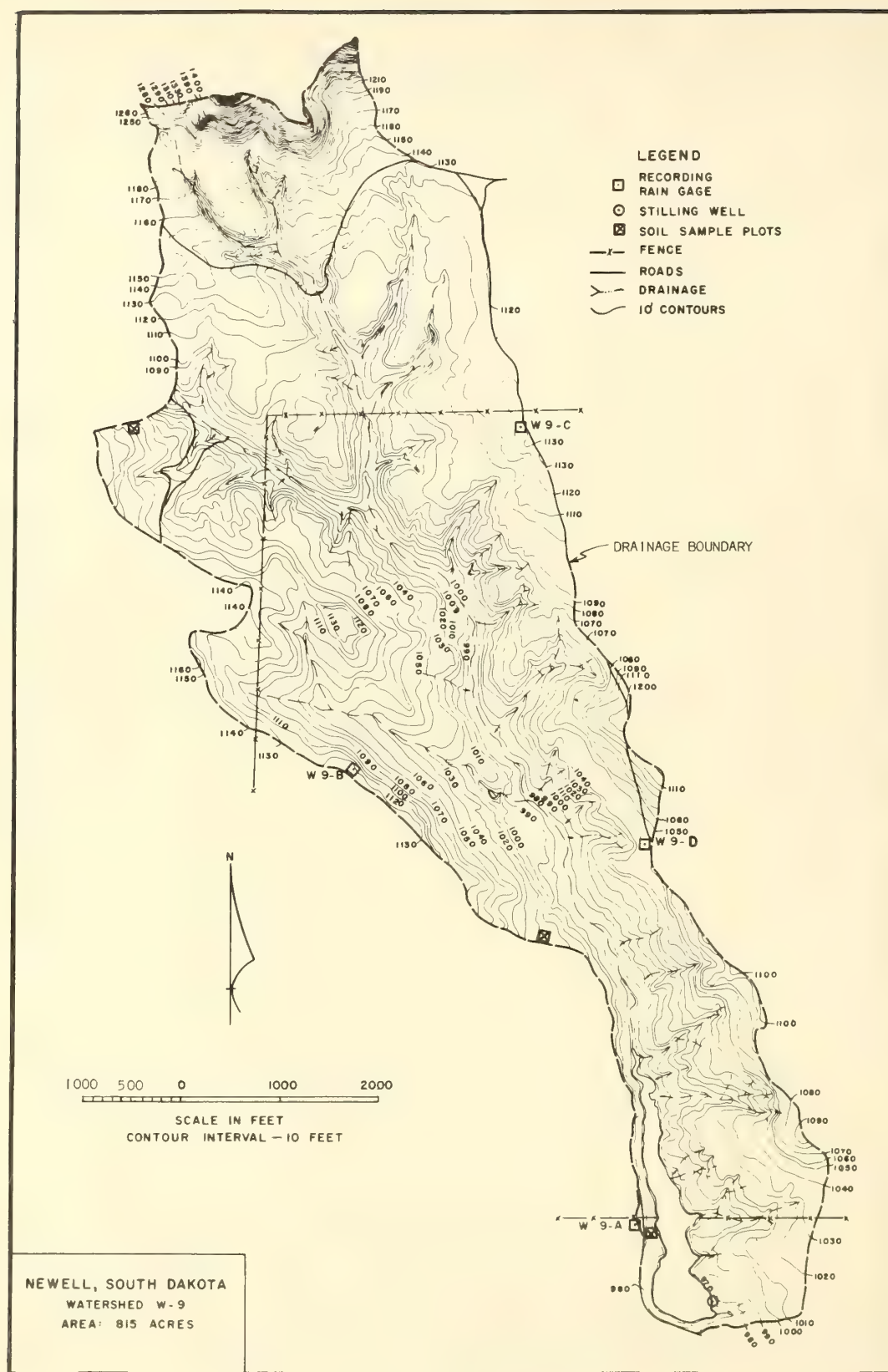
Notes: Normal is based on 50 year record 1908-1957 at NDWB station, Newell, South Dakota.  
1/ Thiessen method precipitation after 1957-58. Prior records from Stanley Smith Co. and others.

| DAILY PRECIPITATION AND RUNOFF (Inches) |                             |                      |      |               |                      | Newell, South Dakota Watershed W-9 |               |        |
|-----------------------------------------|-----------------------------|----------------------|------|---------------|----------------------|------------------------------------|---------------|--------|
| Date                                    | Precipitation <sup>1/</sup> | Runoff <sup>2/</sup> | Date | Precipitation | Runoff <sup>2/</sup> | Date                               | Precipitation | Runoff |
| 1958                                    |                             |                      | 1959 |               |                      |                                    |               |        |
| 1-20 <sup>3/</sup>                      | 0.0                         | 0.005                | 1-1  | 0.05          | 0.0                  |                                    |               |        |
| 1-29                                    | .01                         | 0                    | 1-6  | .05           | 0                    |                                    |               |        |
| 2-4                                     | 0                           | .005                 | 1-13 | .05           | 0                    |                                    |               |        |
| 2-18                                    | 0                           | .014                 | 1-15 | .03           | 0                    |                                    |               |        |
| 3-4                                     | .30                         | .002                 | 1-18 | .05           | 0                    |                                    |               |        |
| 3-13                                    | .05                         | 0                    | 1-20 | .01           | 0                    |                                    |               |        |
| 4-2                                     | .60                         | .032                 | 1-21 | .01           | 0                    |                                    |               |        |
| 4-10                                    | .35                         | .002                 | 1-24 | .01           | 0                    |                                    |               |        |
| 4-29                                    | .85                         | .050                 | 1-25 | .01           | 0                    |                                    |               |        |
| 5-21 <sup>5/</sup>                      | .21                         | nr                   | 1-29 | .05           | 0                    |                                    |               |        |
| 5-29                                    | .20                         | 0                    | 1-30 | .05           | 0                    |                                    |               |        |
| 6-1                                     | .39                         | 0                    | 2-5  | .02           | 0                    |                                    |               |        |
| 6-2                                     | .59                         | 0                    | 2-9  | .05           | 0                    |                                    |               |        |
| 6-3                                     | .33                         | 0                    | 2-13 | .05           | 0                    |                                    |               |        |
| 6-7                                     | 1.10                        | nr                   | 2-14 | .04           | 0                    |                                    |               |        |
| 6-8                                     | .31                         | nr                   | 2-16 | .04           | .035 <sup>4/</sup>   |                                    |               |        |
| 6-9                                     | .71                         | .248                 | 2-17 | .03           | nr                   |                                    |               |        |
| 6-12                                    | .59                         | nr                   | 2-26 | .06           | nr                   |                                    |               |        |
| 6-13                                    | .31                         | .060                 | 3-9  | .04           | nr                   |                                    |               |        |
| 6-14                                    | .16                         | 0                    | 3-12 | .01           | nr                   |                                    |               |        |
| 6-24                                    | .08                         | 0                    | 3-13 | .02           | nr                   |                                    |               |        |
| 7-2                                     | .86                         | nr                   | 3-18 | 0             | .181 <sup>4/</sup>   |                                    |               |        |
| 7-12                                    | .21                         | nr                   | 3-19 | .01           | 0                    |                                    |               |        |
| 7-14                                    | .48                         | nr                   | 3-20 | .03           | 0                    |                                    |               |        |
| 7-30                                    | .13                         | nr                   | 3-31 | 0             | .027 <sup>4/</sup>   |                                    |               |        |
| 8-2                                     | .09                         | 0                    | 4-1  | 0             | .007                 |                                    |               |        |
| 8-3                                     | .18                         | nr                   | 4-8  | .02           | 0                    |                                    |               |        |
| 8-29                                    | .40                         | 0                    | 4-9  | .01           | 0                    |                                    |               |        |
| 9-13                                    | .09                         | 0                    | 4-15 | .21           | 0                    |                                    |               |        |
| 9-25                                    | .02                         | 0                    | 4-16 | .26           | 0                    |                                    |               |        |
| 10-8                                    | .02                         | 0                    | 4-17 | .01           | 0                    |                                    |               |        |
| 10-20                                   | .28                         | 0                    | 4-18 | .08           | .003                 |                                    |               |        |
| 10-21                                   | .06                         | .009                 | 4-19 | .15           | 0                    |                                    |               |        |
| 11-8                                    | .02                         | 0                    | 4-20 | .01           | 0                    |                                    |               |        |
| 11-14                                   | .40                         | nr                   | 4-21 | 0             | .002                 |                                    |               |        |
| 11-20                                   | 0                           | .005 <sup>4/</sup>   | 4-22 | 0             | .005                 |                                    |               |        |
| 11-23                                   | .02                         | 0                    | 4-23 | .08           | 0                    |                                    |               |        |
| 12-6                                    | .05                         | 0                    | 5-1  | .24           | 0                    |                                    |               |        |
| 12-10                                   | .06                         | 0                    | 5-5  | .01           | 0                    |                                    |               |        |
| 12-12                                   | .04                         | 0                    | 5-9  | .07           | 0                    |                                    |               |        |
| 12-13                                   | .06                         | 0                    | 5-10 | .05           | 0                    |                                    |               |        |
| 12-14                                   | .03                         | 0                    | 5-19 | .16           | 0                    |                                    |               |        |
|                                         |                             |                      | 5-20 | .50           | .009                 |                                    |               |        |
|                                         |                             |                      | 5-22 | .37           | .003                 |                                    |               |        |
|                                         |                             |                      | 5-27 | .14           | 0                    |                                    |               |        |
|                                         |                             |                      | 5-28 | .08           | 0                    |                                    |               |        |
|                                         |                             |                      | 5-29 | .44           | .002                 |                                    |               |        |
|                                         |                             |                      | 5-30 | .60           | .016                 |                                    |               |        |
|                                         |                             |                      | 5-31 | .25           | .003                 |                                    |               |        |
|                                         |                             |                      | 6-7  | .04           | 0                    |                                    |               |        |
|                                         |                             |                      | 6-14 | .06           | 0                    |                                    |               |        |
|                                         |                             |                      | 6-17 | .03           | 0                    |                                    |               |        |
|                                         |                             |                      | 6-21 | .05           | 0                    |                                    |               |        |
|                                         |                             |                      | 6-22 | .01           | 0                    |                                    |               |        |
|                                         |                             |                      | 6-24 | .37           | 0                    |                                    |               |        |
|                                         |                             |                      | 6-25 | .29           | 0                    |                                    |               |        |
|                                         |                             |                      | 6-26 | .19           | 0                    |                                    |               |        |
|                                         |                             |                      | 6-29 | .12           | 0                    |                                    |               |        |
|                                         |                             |                      | 6-30 | .65           | 0                    |                                    |               |        |
|                                         |                             |                      | 7-3  | .42           | 0                    |                                    |               |        |
|                                         |                             |                      | 7-7  | .05           | 0                    |                                    |               |        |
|                                         |                             |                      | 7-15 | .29           | 0                    |                                    |               |        |
|                                         |                             |                      | 7-16 | .08           | 0                    |                                    |               |        |
|                                         |                             |                      | 7-17 | .20           | .007                 |                                    |               |        |
|                                         |                             |                      | 8-5  | .05           | 0                    |                                    |               |        |

Notes: Quality of records: Precipitation - good except period before 5-21-58 which are fair. Runoff - good except for period before 8-21-58 which are fair. Months of Jan., Feb., Mar., Apr., Nov. and Dec. include snow and snow melt.  
<sup>1/</sup> Precipitation prior to 5-21-58 from Smeenk's gage. <sup>2/</sup> Runoff prior to 8-21-58 based on weekly observations.  
<sup>3/</sup> Start of observations. <sup>4/</sup> Runoff between observation dates. <sup>5/</sup> Recording raingages installed.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       | Newell, South Dakota Watershed V-2 |        |      |               |        |
|-----------------------------------------|---------------|--------|-------|------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation                      | Runoff | Date | Precipitation | Runoff |
|                                         |               |        | 1959  |                                    |        |      |               |        |
|                                         |               |        | 8-6   | .17                                | 0.0    |      |               |        |
|                                         |               |        | 8-7   | .01                                | 0      |      |               |        |
|                                         |               |        | 8-8   | .11                                | 0      |      |               |        |
|                                         |               |        | 8-11  | .03                                | 0      |      |               |        |
|                                         |               |        | 8-25  | .02                                | 0      |      |               |        |
|                                         |               |        | 8-30  | .03                                | 0      |      |               |        |
|                                         |               |        | 9-15  | .01                                | 0      |      |               |        |
|                                         |               |        | 9-16  | .35                                | 0      |      |               |        |
|                                         |               |        | 9-17  | .52                                | 0      |      |               |        |
|                                         |               |        | 9-18  | .05                                | 0      |      |               |        |
|                                         |               |        | 9-21  | .30                                | 0      |      |               |        |
|                                         |               |        | 9-21  | .26                                | 0      |      |               |        |
|                                         |               |        | 9-25  | .45                                | .001   |      |               |        |
|                                         |               |        | 9-27  | .01                                | 0      |      |               |        |
|                                         |               |        | 9-28  | .02                                | 0      |      |               |        |
|                                         |               |        | 9-29  | .01                                | 0      |      |               |        |
|                                         |               |        | 9-30  | .01                                | 0      |      |               |        |
|                                         |               |        | 10-1  | .01                                | 0      |      |               |        |
|                                         |               |        | 10-1  | .01                                | 0      |      |               |        |
|                                         |               |        | 10-4  | .01                                | 0      |      |               |        |
|                                         |               |        | 10-5  | .01                                | 0      |      |               |        |
|                                         |               |        | 10-7  | .11                                | 0      |      |               |        |
|                                         |               |        | 10-9  | .24                                | 0      |      |               |        |
|                                         |               |        | 10-12 | .04                                | 0      |      |               |        |
|                                         |               |        | 10-23 | .01                                | 0      |      |               |        |
|                                         |               |        | 10-24 | .04                                | 0      |      |               |        |
|                                         |               |        | 10-27 | .02                                | 0      |      |               |        |
|                                         |               |        | 11-1  | .13                                | .005   |      |               |        |
|                                         |               |        | 11-11 | .03                                | 0      |      |               |        |
|                                         |               |        | 11-12 | .04                                | 0      |      |               |        |
|                                         |               |        | 11-13 | .03                                | 0      |      |               |        |
|                                         |               |        | 11-15 | .03                                | 0      |      |               |        |
|                                         |               |        | 11-16 | .01                                | 0      |      |               |        |
|                                         |               |        | 11-21 | .01                                | 0      |      |               |        |
|                                         |               |        | 11-22 | .01                                | 0      |      |               |        |
|                                         |               |        | 11-23 | .33                                | 0      |      |               |        |
|                                         |               |        | 11-24 | .02                                | 0      |      |               |        |
|                                         |               |        | 11-25 | .01                                | 0      |      |               |        |
|                                         |               |        | 12-1  | .03                                | .003   |      |               |        |
|                                         |               |        | 12-7  | .02                                | 0      |      |               |        |
|                                         |               |        | 12-11 | .02                                | 0      |      |               |        |
|                                         |               |        | 12-20 | .02                                | 0      |      |               |        |
|                                         |               |        | 12-21 | .02                                | 0      |      |               |        |
|                                         |               |        | 12-24 | .01                                | 0      |      |               |        |
|                                         |               |        | 12-27 | .01                                | 0      |      |               |        |
|                                         |               |        | 12-29 | .02                                | 0      |      |               |        |
|                                         |               |        | 12-30 | .01                                | 0      |      |               |        |
| Notes:                                  |               |        |       |                                    |        |      |               |        |





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1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

\* Precipitation: Snow: 127.00 inches; Rain: 10.00 inches; Sleet: 0.00 inches; Hail: 0.00 inches. No sea level record. Early precipitation records

THE UNIVERSITY OF CHICAGO

```

from itertools import combinations
from math import sqrt

def isPrime(n):
    if n < 2:
        return False
    for i in range(2, int(sqrt(n)) + 1):
        if n % i == 0:
            return False
    return True

def findPrimes(n):
    primes = []
    for i in range(2, n + 1):
        if isPrime(i):
            primes.append(i)
    return primes

def findTriplets(n):
    primes = findPrimes(n)
    for i in range(1, len(primes)):
        for j in range(i + 1, len(primes)):
            for k in range(j + 1, len(primes)):
                if primes[i] + primes[j] + primes[k] == n:
                    return (primes[i], primes[j], primes[k])
    return None

n = 30
triplet = findTriplets(n)
if triplet:
    print(triplet)
else:
    print("No triplet found")

```

*[Faint, illegible handwritten text]*

... ..

53: (Degree of grazing of rangeland) 1957 - moderate; 1958 - full; 1959 - full.

2. SOILS : Badlands of Pierre Shale Plains, particularly the more dispersed soils in areas of less than 14 inches average annual precipitation. Pierre Shale Plains and Badlands land resource area (G-60).

Notes:

- 1/ Precipitation prior to 20-30-50, Don Hove 1966.

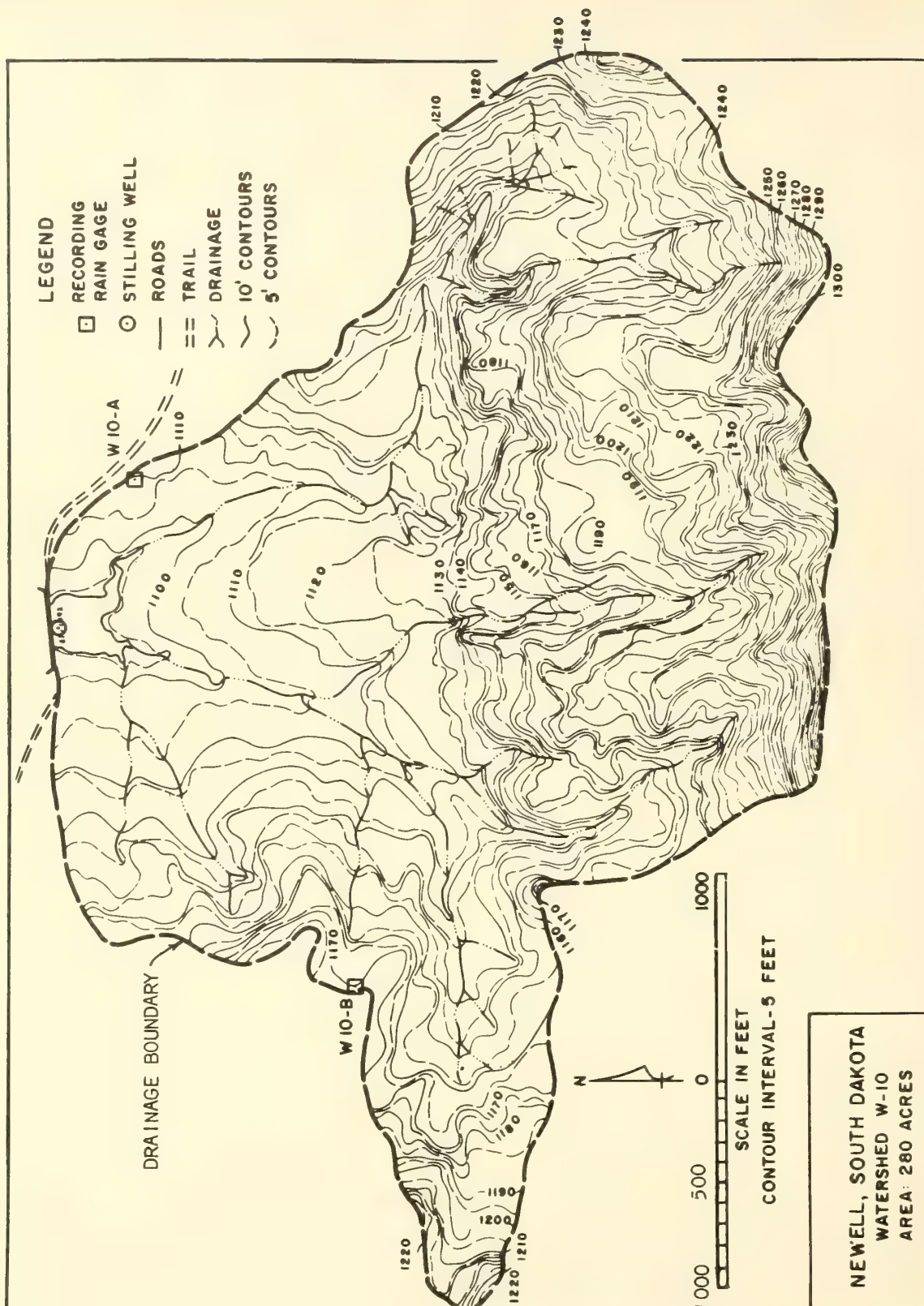
Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.

| DAILY PRECIPITATION AND RUNOFF (Inches) |                |                  |                |               |                  | Newell, South Dakota Watershed W-10 |               |        |
|-----------------------------------------|----------------|------------------|----------------|---------------|------------------|-------------------------------------|---------------|--------|
| Date                                    | Precipitation  | Runoff <u>2/</u> | Date           | Precipitation | Runoff <u>2/</u> | Date                                | Precipitation | Runoff |
| 1958                                    |                |                  | 1959           |               |                  |                                     |               |        |
| 1-27 <u>2/</u>                          | .02 <u>1/</u>  | 0                | 1-1            | .03           | 0                |                                     |               |        |
| 2-26                                    | .04 <u>1/</u>  | 0                | 1-13           | .05           | 0                |                                     |               |        |
| 3-2                                     | .04 <u>1/</u>  | .022             | 1-16,20        | .03           | 0                |                                     |               |        |
| 4-17                                    | 0              | .032             | 1-30           | .04           | 0                |                                     |               |        |
| 5-10                                    | .25            | .235             | 2-7,14,5       | .13           | 0                |                                     |               |        |
| 6-1                                     | 1.20           | 0                | 2-9            | .01           | 0                |                                     |               |        |
| 6-18                                    | "r             | .025             | 2-13           | .07           | 0                |                                     |               |        |
| 6-25                                    | 3.00 <u>1/</u> | 0                | 2-17           | .06           | 0                |                                     |               |        |
| 7-15                                    | .10 <u>1/</u>  | 0                | 3-1            | .02           | 0                |                                     |               |        |
| 7-24                                    | .20            | 0                | 3-6            | 0             | 0                |                                     |               |        |
| 8-12                                    | .10            | 0                | 3-12,13        | .00           | 0                |                                     |               |        |
| 9-2 <u>5/</u>                           | .10            | 0                | 3-24           | .03           | .203             |                                     |               |        |
| 10-22                                   | .25            | 0                | 4-1 <u>1/</u>  | 0             | .025             |                                     |               |        |
| 11-14,17                                | .25            | 0                | 4-8            | .05           | 0                |                                     |               |        |
| 11-19                                   |                | .004             | 4-15,16        | .30           | 0                |                                     |               |        |
| 12-2                                    | .03            | 0                | 4-19           | .12           | 0                |                                     |               |        |
| 12-23                                   | .12            | 0                | 4-23           | .05           | 0                |                                     |               |        |
|                                         |                |                  | 4-25,27        | .25           | .041             |                                     |               |        |
|                                         |                |                  | 5-1            | .28           | 0                |                                     |               |        |
|                                         |                |                  | 5-5            | .04           | 0                |                                     |               |        |
|                                         |                |                  | 5-10           | .19           | 0                |                                     |               |        |
|                                         |                |                  | 5-16           | .10           | 0                |                                     |               |        |
|                                         |                |                  | 5-19           | .07           | 0                |                                     |               |        |
|                                         |                |                  | 5-20           | .17           | 0                |                                     |               |        |
|                                         |                |                  | 5-21           | .16           | 0                |                                     |               |        |
|                                         |                |                  | 5-27           | .25           | 0                |                                     |               |        |
|                                         |                |                  | 5-28           | .62           | 0                |                                     |               |        |
|                                         |                |                  | 5-29           | .68           | .137             |                                     |               |        |
|                                         |                |                  | 5-30           | .27           | 0                |                                     |               |        |
|                                         |                |                  | 6-7            | .15           | 0                |                                     |               |        |
|                                         |                |                  | 6-14           | .01           | 0                |                                     |               |        |
|                                         |                |                  | 6-16           | .01           | 0                |                                     |               |        |
|                                         |                |                  | 6-17           | .05           | 0                |                                     |               |        |
|                                         |                |                  | 6-21           | .10           | 0                |                                     |               |        |
|                                         |                |                  | 6-24           | .54           | .002             |                                     |               |        |
|                                         |                |                  | 6-25           | .25           | 0                |                                     |               |        |
|                                         |                |                  | 6-26           | .50           | 0                |                                     |               |        |
|                                         |                |                  | 6-28           | .17           | 0                |                                     |               |        |
|                                         |                |                  | 6-30           | .70           | .007             |                                     |               |        |
|                                         |                |                  | 7-3            | .10           | 0                |                                     |               |        |
|                                         |                |                  | 7-6            | .22           | 0                |                                     |               |        |
|                                         |                |                  | 7-13           | .10           | 0                |                                     |               |        |
|                                         |                |                  | 7-15 <u>5/</u> | .77           | T                |                                     |               |        |
|                                         |                |                  | 7-16           | .01           | 0                |                                     |               |        |
|                                         |                |                  | 8-11           | .02           | 0                |                                     |               |        |
|                                         |                |                  | 8-16           | .16           | .002             |                                     |               |        |
|                                         |                |                  | 8-20           | .05           | 0                |                                     |               |        |
|                                         |                |                  | 8-21           | .27           | 0                |                                     |               |        |
|                                         |                |                  | 8-21           | .05           | 0                |                                     |               |        |
|                                         |                |                  | 8-21           | .05           | 0                |                                     |               |        |
|                                         |                |                  | 9-16           | .17           | .002             |                                     |               |        |
|                                         |                |                  | 9-17           | .25           | T                |                                     |               |        |
|                                         |                |                  | 9-20           | .04           | 0                |                                     |               |        |
|                                         |                |                  | 9-21           | .03           | 0                |                                     |               |        |
|                                         |                |                  | 9-24           | .37           | 0                |                                     |               |        |
|                                         |                |                  | 9-25           | .14           | T                |                                     |               |        |
|                                         |                |                  | 9-26           | .02           | 0                |                                     |               |        |
|                                         |                |                  | 9-28           | .01           | 0                |                                     |               |        |
|                                         |                |                  | 9-29           | .01           | 0                |                                     |               |        |
|                                         |                |                  | 10-1           | .01           | 0                |                                     |               |        |
|                                         |                |                  | 10-5           | .01           | 0                |                                     |               |        |
|                                         |                |                  | 10-7           | .19           | 0                |                                     |               |        |
|                                         |                |                  | 10-9           | .18           | T                |                                     |               |        |
|                                         |                |                  | 10-12          | .06           | 0                |                                     |               |        |
|                                         |                |                  | 10-25          | .10           | 0                |                                     |               |        |

Notes: Quality of records: Precipitation - good. Runoff - good except for period before 3-31-59, which is fair. Months of Jan., Feb., Mar., Apr., Nov. and Dec. include snow and snow melt. 1/ Precipitation from Don Hoyer gage. 2/ Runoff based on weekly observations prior to 3-31-59. 3/ Start of observations. 4/ Stare recorder installed. 5/ Raingages installed.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       | Newell, South Dakota Watershed 11-10 |        |      |               |        |
|-----------------------------------------|---------------|--------|-------|--------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation                        | Runoff | Date | Precipitation | Runoff |
|                                         |               |        | 12-9  |                                      |        |      |               |        |
|                                         |               |        | 11-4  | 0.17                                 | 0.007  |      |               |        |
|                                         |               |        | 11-11 | .03                                  | 0      |      |               |        |
|                                         |               |        | 11-12 | .05                                  | 0      |      |               |        |
|                                         |               |        | 11-13 | .07                                  | 0      |      |               |        |
|                                         |               |        | 11-15 | .06                                  | 0      |      |               |        |
|                                         |               |        | 11-21 | .06                                  | 0      |      |               |        |
|                                         |               |        | 11-22 | .03                                  | 0      |      |               |        |
|                                         |               |        | 11-23 | .04                                  | 0      |      |               |        |
|                                         |               |        | 11-25 | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-2  | .02                                  | 0      |      |               |        |
|                                         |               |        | 12-3  | .00                                  | 0      |      |               |        |
|                                         |               |        | 12-20 | .00                                  | .006   |      |               |        |
|                                         |               |        | 12-21 | .02                                  | 0      |      |               |        |
|                                         |               |        | 12-26 | .00                                  | 0      |      |               |        |
|                                         |               |        | 12-27 | .03                                  | 0      |      |               |        |
|                                         |               |        | 12-30 | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-31 | .02                                  | 0      |      |               |        |
| Notes:                                  |               |        |       |                                      |        |      |               |        |





1900

$\frac{d}{dt} \left( \frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

A 1970 23

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1990. *Neurobiology of the Human Brain*. New York: Oxford University Press.

$$\text{rank}(A) = \dim(\text{Col } A) = \dim\langle [a_1] \dots [a_n]\rangle = \dim\langle [a_1] \dots [a_r] \rangle = r.$$

FLOW: Ephemeral, cor...

WIND: S.W. 10-15 mph. Early precipitation.

... all the other ...

14: Degree of grazing of rangeland 1955 - moderate; 1956 - full; 1959 - full.

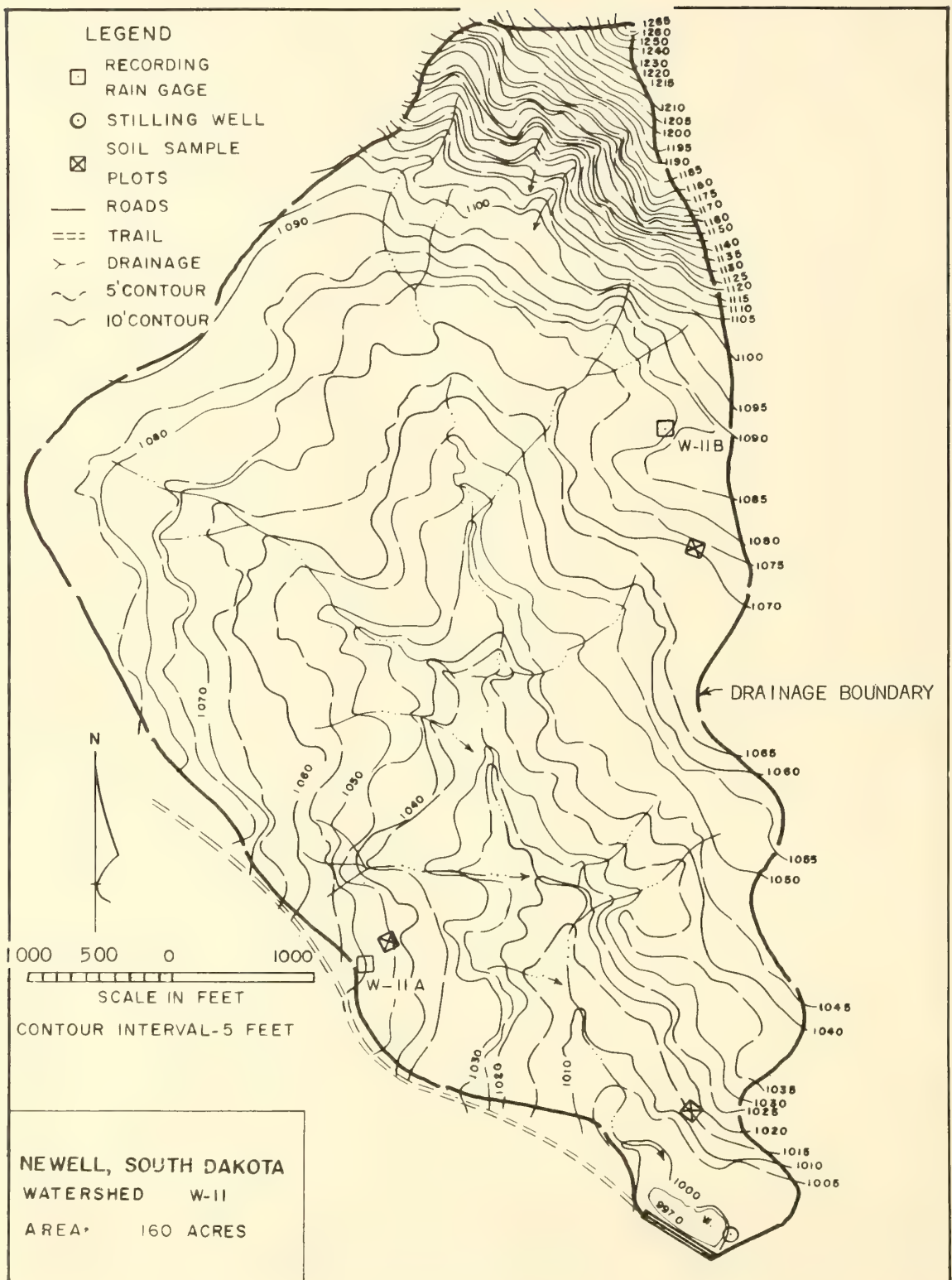
Pierre Shale: Pierre Shale is the name of the rock which contains the fossils. Pierre Shale  
has been called "the fossiliferous shale".

Notes: 1/ Precipitation prior to 10-28-50 from Don Hoyer gauge.  
2/ Thieser weighted precipitation after 6-24-50 (2 gauges)  
Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.

| DAILY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                             |                      |                    |               |                      | Newell, South Dakota Watershed W-11 |               |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------|--------------------|---------------|----------------------|-------------------------------------|---------------|--------|
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Precipitation <sup>1/</sup> | Runoff <sup>2/</sup> | Date               | Precipitation | Runoff <sup>2/</sup> | Date                                | Precipitation | Runoff |
| 1958                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                      | 1959               |               |                      |                                     |               |        |
| 1-27 <sup>3/</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | .02                         | 0                    | 1-1                | .03           | 0                    |                                     |               |        |
| 2-26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .04                         | .006                 | 1-13               | .05           | 0                    |                                     |               |        |
| 4-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | .04                         | 0                    | 1-19               | .05           | 0                    |                                     |               |        |
| 4-17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                           | .001                 | 1-20               | .04           | 0                    |                                     |               |        |
| 5-19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .35                         | .132                 | 1-24               | .01           | 0                    |                                     |               |        |
| 6-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.20                        | 0                    | 1-29               | .04           | 0                    |                                     |               |        |
| 6-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.00                        | .098                 | 2-3                | .05           | 0                    |                                     |               |        |
| 7-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .10                         | 0                    | 2-4                | .05           | 0                    |                                     |               |        |
| 7-24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .20                         | 0                    | 2-5                | .03           | 0                    |                                     |               |        |
| 8-12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .10                         | 0                    | 2-9                | .01           | 0                    |                                     |               |        |
| 9-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | .10                         | 0                    | 2-13               | .07           | 0                    |                                     |               |        |
| 10-22 <sup>4/</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | .25                         | 0                    | 2-17               | .06           | 0                    |                                     |               |        |
| 11-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .08                         | 0                    | 3-4                | .02           | 0                    |                                     |               |        |
| 11-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .13                         | 0                    | 3-12               | .03           | 0                    |                                     |               |        |
| 11-17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .16                         | .006                 | 3-13               | .05           | 0                    |                                     |               |        |
| 12-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .03                         | 0                    | 3-24               | .03           | 0                    |                                     |               |        |
| 12-10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .12                         | 0                    | 3-29               | T             | .355                 |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 4-15               | .17           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 4-16               | .20           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 4-19               | .03           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 4-23               | .05           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 4-27               | T             | .012                 |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-4                | .15           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-5                | .05           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-10               | .15           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-16               | .10           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-18               | .03           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-19               | .03           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-20               | .17           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-21               | .06           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-25               | .06           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-27               | .27           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-28               | .17           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-29               | .17           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 5-30               | .72           | .006                 |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 6-7                | .22           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 6-21 <sup>5/</sup> | .10           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 6-24 <sup>5/</sup> | .56           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 6-25               | .21           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 6-26               | .52           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 6-28               | .11           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 6-30               | .62           | .004                 |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 7-1                | .07           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 7-3                | .10           | .003                 |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 7-6                | .27           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 7-12               | .03           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 7-15               | .66           | .009                 |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 7-17               | .02           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 8-11               | .05           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 8-12               | .13           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 8-30               | .04           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 8-31               | .04           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 9-1                | .04           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 9-15               | .10           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 9-16               | .31           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 9-17               | .20           | .004                 |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 9-21               | .04           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 9-22               | .75           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 9-25               | .40           | .005                 |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 9-26               | .03           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 9-29               | .00           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 10-4               | .01           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 10-5               | .01           | 0                    |                                     |               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                      | 10-7               | .20           | 0                    |                                     |               |        |
| <b>Notes:</b> Quality of records: Precipitation - good except for period before 10-22-58 which is fair; runoff - good except for period before 6-21-58 which is fair. Months of Jan., Feb., Mar., Apr., May, and Dec. include snow and snow melt.<br><sup>1/</sup> Precipitation prior to 10-22-58 from Don Hoyer gage. <sup>2/</sup> Runoff based on weekly observations prior to 5-30-59.<br><sup>3/</sup> Start of observations. <sup>4/</sup> Raingages installed. <sup>5/</sup> Stage recorder installed. <sup>6/</sup> Thiessen weighted precipitation after 6-24-59 (according rain-gages A, B and C). |                             |                      |                    |               |                      |                                     |               |        |

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       | Newell, South Dakota Watershed M-11 |        |      |               |        |
|-----------------------------------------|---------------|--------|-------|-------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation                       | Runoff | Date | Precipitation | Runoff |
|                                         |               |        | 1959  |                                     |        |      |               |        |
|                                         |               |        | 10-9  | .15                                 | 0      |      |               |        |
|                                         |               |        | 10-12 | .06                                 | 0      |      |               |        |
|                                         |               |        | 10-25 | .05                                 | 0      |      |               |        |
|                                         |               |        | 10-27 | .07                                 | 0      |      |               |        |
|                                         |               |        | 11-4  | .15                                 | 0      |      |               |        |
|                                         |               |        | 11-11 | .03                                 | .009   |      |               |        |
|                                         |               |        | 11-12 | .03                                 | 0      |      |               |        |
|                                         |               |        | 11-18 | .07                                 | 0      |      |               |        |
|                                         |               |        | 11-21 | .05                                 | 0      |      |               |        |
|                                         |               |        | 11-22 | .03                                 | 0      |      |               |        |
|                                         |               |        | 11-23 | .23                                 | 0      |      |               |        |
|                                         |               |        | 12-3  | .03                                 | 0      |      |               |        |
|                                         |               |        | 12-4  | .02                                 | 0      |      |               |        |
|                                         |               |        | 12-20 | .03                                 | 0      |      |               |        |
|                                         |               |        | 12-21 | .02                                 | 0      |      |               |        |
|                                         |               |        | 12-22 | .01                                 | 0      |      |               |        |
|                                         |               |        | 12-23 | .02                                 | 0      |      |               |        |
|                                         |               |        | 12-24 | .04                                 | 0      |      |               |        |
| Notes:                                  |               |        |       |                                     |        |      |               |        |





NOTE: Can shape 2000 in 500.

1. *Phragmites australis* (Cav.) Trin. ex Steud.

[illegible]

TESTING DATA:  $\mu = 100$ ;  $\sigma^2 = 1$  (variance per pair). Error: total on: 40 per pair = 40.

[illegible]

SE: (Degree of grazing of rangeland) 1957 - full; 1958 - full; 1959 - close.

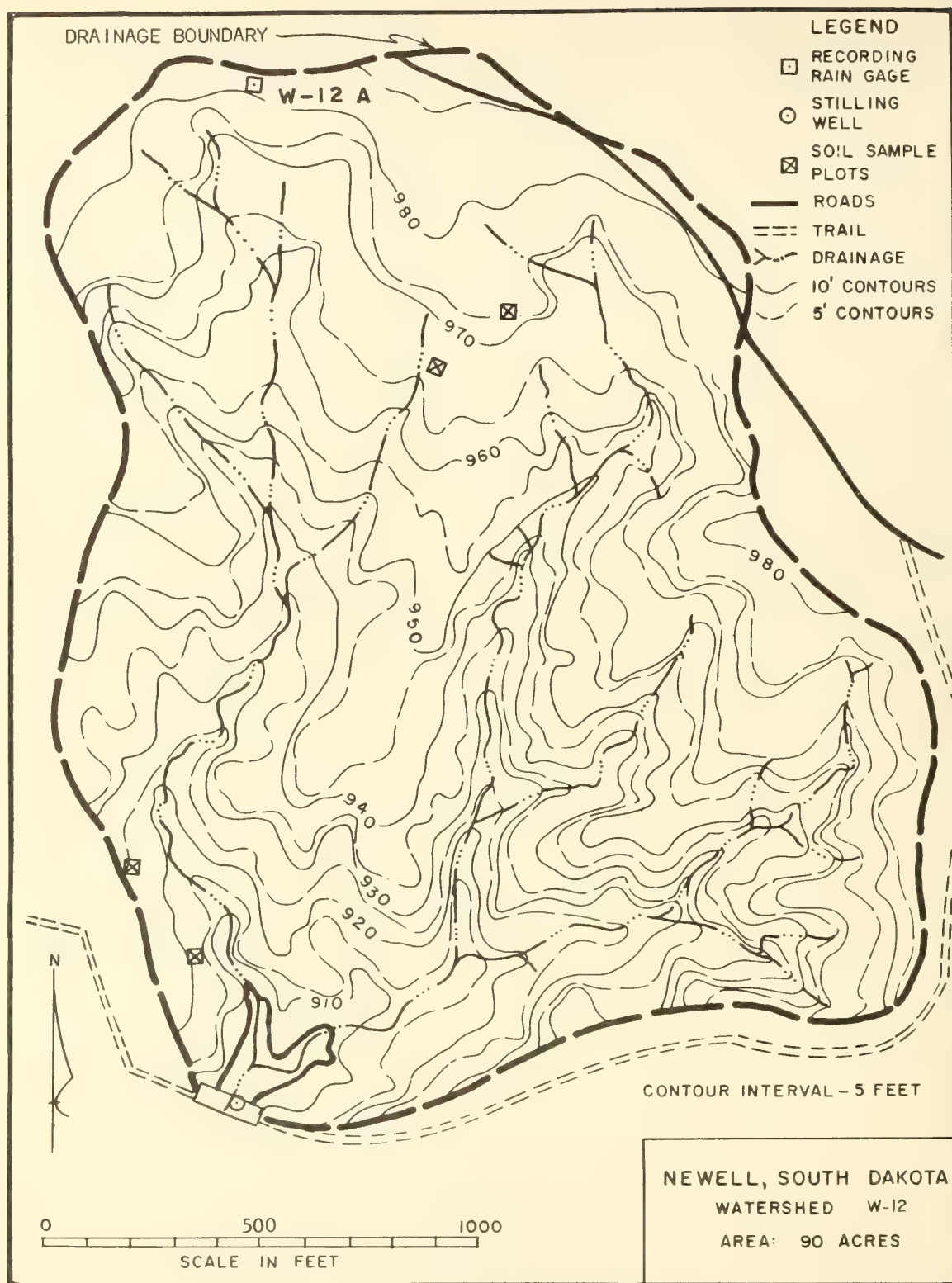
FIGURE 10-10-101: Leading in Pierre Shale area, especially areas leading into 'lower' large fractures. Pierre Shale Plains and Badlands land resource area (G-6C).

Notes: Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.

| DAILY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                    |               |                  |      |               |                  | Newell, South Dakota Watershed W-12 |               |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------|------|---------------|------------------|-------------------------------------|---------------|--------|
| Date                                                                                                                                                                                                                                                                                                                                                                                       | Precipitation | Runoff <u>1/</u> | Date | Precipitation | Runoff <u>1/</u> | Date                                | Precipitation | Runoff |
| 1958                                                                                                                                                                                                                                                                                                                                                                                       |               |                  | 1959 |               |                  |                                     |               |        |
| 1-29 <u>2/</u>                                                                                                                                                                                                                                                                                                                                                                             | 0.01          | 0                | 1-1  | 0.03          | 0                |                                     |               |        |
| 1-30                                                                                                                                                                                                                                                                                                                                                                                       | .18           | 0                | 1-13 | .02           | 0                |                                     |               |        |
| 2-17 <u>3/</u>                                                                                                                                                                                                                                                                                                                                                                             | .02           | 0                | 1-17 | .06           | 0                |                                     |               |        |
| 2-25                                                                                                                                                                                                                                                                                                                                                                                       | .21           | .02 <u>1/</u>    | 1-25 | .09           | 0                |                                     |               |        |
| 2-28                                                                                                                                                                                                                                                                                                                                                                                       | .11           | 0                | 1-29 | .05           | 0                |                                     |               |        |
| 3-10                                                                                                                                                                                                                                                                                                                                                                                       | .05           | 0                | 1-30 | .03           | 0                |                                     |               |        |
| 3-19                                                                                                                                                                                                                                                                                                                                                                                       | .06           | 0                | 2-3  | .01           | 0                |                                     |               |        |
| 3-21                                                                                                                                                                                                                                                                                                                                                                                       | 0             | .030             | 2-4  | .01           | 0                |                                     |               |        |
| 3-22                                                                                                                                                                                                                                                                                                                                                                                       | .06           | .006             | 2-5  | .01           | 0                |                                     |               |        |
| 3-23                                                                                                                                                                                                                                                                                                                                                                                       | 0             | .015             | 2-9  | .01           | 0                |                                     |               |        |
| 3-24                                                                                                                                                                                                                                                                                                                                                                                       | 0             | .003             | 2-13 | .07           | 0                |                                     |               |        |
| 3-25                                                                                                                                                                                                                                                                                                                                                                                       | .04           | .002             | 2-17 | .06           | 0                |                                     |               |        |
| 3-26                                                                                                                                                                                                                                                                                                                                                                                       | .04           | .005             | 2-25 | .01           | 0                |                                     |               |        |
| 3-27                                                                                                                                                                                                                                                                                                                                                                                       | .01           | .002             | 2-26 | .03           | 0                |                                     |               |        |
| 3-28                                                                                                                                                                                                                                                                                                                                                                                       | 0             | .004             | 3-9  | .06           | .135 <u>4/</u>   |                                     |               |        |
| 3-29                                                                                                                                                                                                                                                                                                                                                                                       | 0             | .004             | 3-10 | 0             | .034             |                                     |               |        |
| 3-30                                                                                                                                                                                                                                                                                                                                                                                       | 0             | .003             | 3-11 | 0             | .031             |                                     |               |        |
| 3-31                                                                                                                                                                                                                                                                                                                                                                                       | .01           | 0                | 3-12 | .01           | .025             |                                     |               |        |
| 4-1                                                                                                                                                                                                                                                                                                                                                                                        | .02           | 0                | 3-13 | .02           | .052             |                                     |               |        |
| 4-5                                                                                                                                                                                                                                                                                                                                                                                        | .20           | 0                | 3-14 | 0             | .060             |                                     |               |        |
| 4-6                                                                                                                                                                                                                                                                                                                                                                                        | .04           | 0                | 3-15 | 0             | .004             |                                     |               |        |
| 4-7                                                                                                                                                                                                                                                                                                                                                                                        | 0             | .182             | 3-16 | 0             | 0                |                                     |               |        |
| 4-21                                                                                                                                                                                                                                                                                                                                                                                       | .05           | 0                | 3-17 | 0             | .029             |                                     |               |        |
| 4-22                                                                                                                                                                                                                                                                                                                                                                                       | .33           | 0                | 3-24 | .04           | 0                |                                     |               |        |
| 4-23                                                                                                                                                                                                                                                                                                                                                                                       | .05           | 0                | 3-26 | 0             | .075             |                                     |               |        |
| 4-24                                                                                                                                                                                                                                                                                                                                                                                       | .09           | .104             | 4-2  | .03           | 0                |                                     |               |        |
| 4-25                                                                                                                                                                                                                                                                                                                                                                                       | .40           | .056             | 4-15 | .12           | 0                |                                     |               |        |
| 4-26                                                                                                                                                                                                                                                                                                                                                                                       | 0             | .094             | 4-16 | .11           | .004             |                                     |               |        |
| 4-27                                                                                                                                                                                                                                                                                                                                                                                       | 0             | .057             | 4-18 | .03           | .004             |                                     |               |        |
| 4-28                                                                                                                                                                                                                                                                                                                                                                                       | 0             | .007             | 4-19 | .07           | .047             |                                     |               |        |
| 4-29                                                                                                                                                                                                                                                                                                                                                                                       | 0             | 0                | 4-20 | .03           | .008             |                                     |               |        |
| 5-6                                                                                                                                                                                                                                                                                                                                                                                        | .16           | 0                | 4-21 | 0             | .061             |                                     |               |        |
| 5-25                                                                                                                                                                                                                                                                                                                                                                                       | .08           | 0                | 4-22 | 0             | .053             |                                     |               |        |
| 5-29                                                                                                                                                                                                                                                                                                                                                                                       | .10           | 0                | 4-23 | .05           | .004             |                                     |               |        |
| 6-2                                                                                                                                                                                                                                                                                                                                                                                        | 1.17          | 0                | 4-25 | .05           | 0                |                                     |               |        |
| 6-3                                                                                                                                                                                                                                                                                                                                                                                        | .64           | .111             | 5-4  | .14           | .003             |                                     |               |        |
| 6-7                                                                                                                                                                                                                                                                                                                                                                                        | .95           | .427             | 5-5  | .03           | 0                |                                     |               |        |
| 6-8                                                                                                                                                                                                                                                                                                                                                                                        | .24           | .030             | 5-6  | .02           | 0                |                                     |               |        |
| 6-9                                                                                                                                                                                                                                                                                                                                                                                        | .23           | .044             | 5-9  | .06           | 0                |                                     |               |        |
| 6-10                                                                                                                                                                                                                                                                                                                                                                                       | .03           | 0                | 5-19 | .05           | 0                |                                     |               |        |
| 6-11                                                                                                                                                                                                                                                                                                                                                                                       | .18           | .026             | 5-20 | .63           | .019             |                                     |               |        |
| 6-12                                                                                                                                                                                                                                                                                                                                                                                       | .28           | .039             | 5-25 | .12           | .008             |                                     |               |        |
| 6-14                                                                                                                                                                                                                                                                                                                                                                                       | .09           | .676             | 5-27 | .08           | 0                |                                     |               |        |
| 6-15                                                                                                                                                                                                                                                                                                                                                                                       | .64           | .487             | 5-28 | .15           | 0                |                                     |               |        |
| 6-19                                                                                                                                                                                                                                                                                                                                                                                       | .07           | 0                | 5-29 | 1.20          | .365             |                                     |               |        |
| 6-20                                                                                                                                                                                                                                                                                                                                                                                       | .18           | 0                | 5-30 | .37           | .158             |                                     |               |        |
| 6-21                                                                                                                                                                                                                                                                                                                                                                                       | .04           | 0                | 5-31 | .06           | .005             |                                     |               |        |
| 7-3                                                                                                                                                                                                                                                                                                                                                                                        | .87           | .129             | 6-13 | .02           | 0                |                                     |               |        |
| 7-4                                                                                                                                                                                                                                                                                                                                                                                        | .01           | 0                | 6-21 | .03           | 0                |                                     |               |        |
| 7-10                                                                                                                                                                                                                                                                                                                                                                                       | .46           | .063             | 6-24 | .81           | .013             |                                     |               |        |
| 7-18                                                                                                                                                                                                                                                                                                                                                                                       | .16           | 0                | 6-26 | .08           | 0                |                                     |               |        |
| 7-27                                                                                                                                                                                                                                                                                                                                                                                       | .17           | 0                | 6-29 | .40           | 0                |                                     |               |        |
| 8-5                                                                                                                                                                                                                                                                                                                                                                                        | .06           | 0                | 6-30 | .66           | .009             |                                     |               |        |
| 8-29                                                                                                                                                                                                                                                                                                                                                                                       | .04           | 0                | 7-3  | .02           | 0                |                                     |               |        |
| 8-30                                                                                                                                                                                                                                                                                                                                                                                       | .22           | 0                | 7-6  | .02           | 0                |                                     |               |        |
| 9-23                                                                                                                                                                                                                                                                                                                                                                                       | .05           | 0                | 7-15 | .47           | 0                |                                     |               |        |
| 10-20                                                                                                                                                                                                                                                                                                                                                                                      | .10           | 0                | 7-16 | .04           | 0                |                                     |               |        |
| 10-21                                                                                                                                                                                                                                                                                                                                                                                      | .04           | 0                | 7-17 | .27           | 0                |                                     |               |        |
| 10-27                                                                                                                                                                                                                                                                                                                                                                                      | .01           | 0                | 7-21 | .11           | 0                |                                     |               |        |
| 11-8                                                                                                                                                                                                                                                                                                                                                                                       | .06           | 0                | 8-7  | .01           | 0                |                                     |               |        |
| 11-14                                                                                                                                                                                                                                                                                                                                                                                      | .20           | 0                | 8-12 | .01           | 0                |                                     |               |        |
| 11-17                                                                                                                                                                                                                                                                                                                                                                                      | 0             | .016             | 8-31 | .01           | 0                |                                     |               |        |
| 11-18                                                                                                                                                                                                                                                                                                                                                                                      | 0             | .003             | 9-16 | .47           | 0                |                                     |               |        |
| 11-19                                                                                                                                                                                                                                                                                                                                                                                      | 0             | .006             | 9-17 | .30           | 0                |                                     |               |        |
| 11-20                                                                                                                                                                                                                                                                                                                                                                                      | 0             | .004             | 9-18 | .06           | 0                |                                     |               |        |
| Notes: Quality of records: Precipitation - good; Runoff - good except for period during winter months which is fair. Months of Jan., Feb., Mar., Apr., Nov. and Dec. include snow and snow melt. <u>1/</u> Runoff based on weekly observations during winter months. <u>2/</u> Start of observations. <u>3/</u> Recording rain gage installed. <u>4/</u> Runoff between observation dates. |               |                  |      |               |                  |                                     |               |        |

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       |               |        | Neve11, South Dakota Watershed N-12 |               |        |
|-----------------------------------------|---------------|--------|-------|---------------|--------|-------------------------------------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation | Runoff | Date                                | Precipitation | Runoff |
| 1958                                    |               |        | 1959  |               |        |                                     |               |        |
| 11-22                                   | 0             | .003   | 9-21  | .04           | .003   |                                     |               |        |
| 11-30                                   | .01           | 0      | 9-24  | .41           | .006   |                                     |               |        |
| 12-11                                   | .02           | 0      | 9-25  | .23           | .006   |                                     |               |        |
| 12-22                                   | .02           | 0      | 9-28  | .05           | 0      |                                     |               |        |
|                                         |               |        | 9-29  | .01           | 0      |                                     |               |        |
|                                         |               |        | 10-7  | .10           | 0      |                                     |               |        |
|                                         |               |        | 10-9  | .18           | .003   |                                     |               |        |
|                                         |               |        | 10-25 | .06           | 0      |                                     |               |        |
|                                         |               |        | 11-4  | .39           | .009   |                                     |               |        |
|                                         |               |        | 11-7  | 0             | .003   |                                     |               |        |
|                                         |               |        | 11-11 | .06           | 0      |                                     |               |        |
|                                         |               |        | 11-12 | .04           | 0      |                                     |               |        |
|                                         |               |        | 11-21 | .03           | 0      |                                     |               |        |
|                                         |               |        | 11-22 | .02           | 0      |                                     |               |        |
|                                         |               |        | 11-23 | .30           | 0      |                                     |               |        |
|                                         |               |        | 11-30 | 0             | .017   |                                     |               |        |
|                                         |               |        | 12-4  | .04           | .040   |                                     |               |        |
|                                         |               |        | 12-14 | 0             | .020   |                                     |               |        |
|                                         |               |        | 12-20 | .01           | 0      |                                     |               |        |
|                                         |               |        | 12-21 | .02           | 0      |                                     |               |        |
|                                         |               |        | 12-26 | .01           | 0      |                                     |               |        |
|                                         |               |        | 12-27 | .01           | 0      |                                     |               |        |
|                                         |               |        | 12-29 | .01           | 0      |                                     |               |        |
|                                         |               |        | 12-31 | .01           | 0      |                                     |               |        |
| Notes:                                  |               |        |       |               |        |                                     |               |        |





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... range of means of population: 1.00 - full; 1.50 - full; 1.50 - close.

*[Faint handwritten notes at the bottom of the page]*

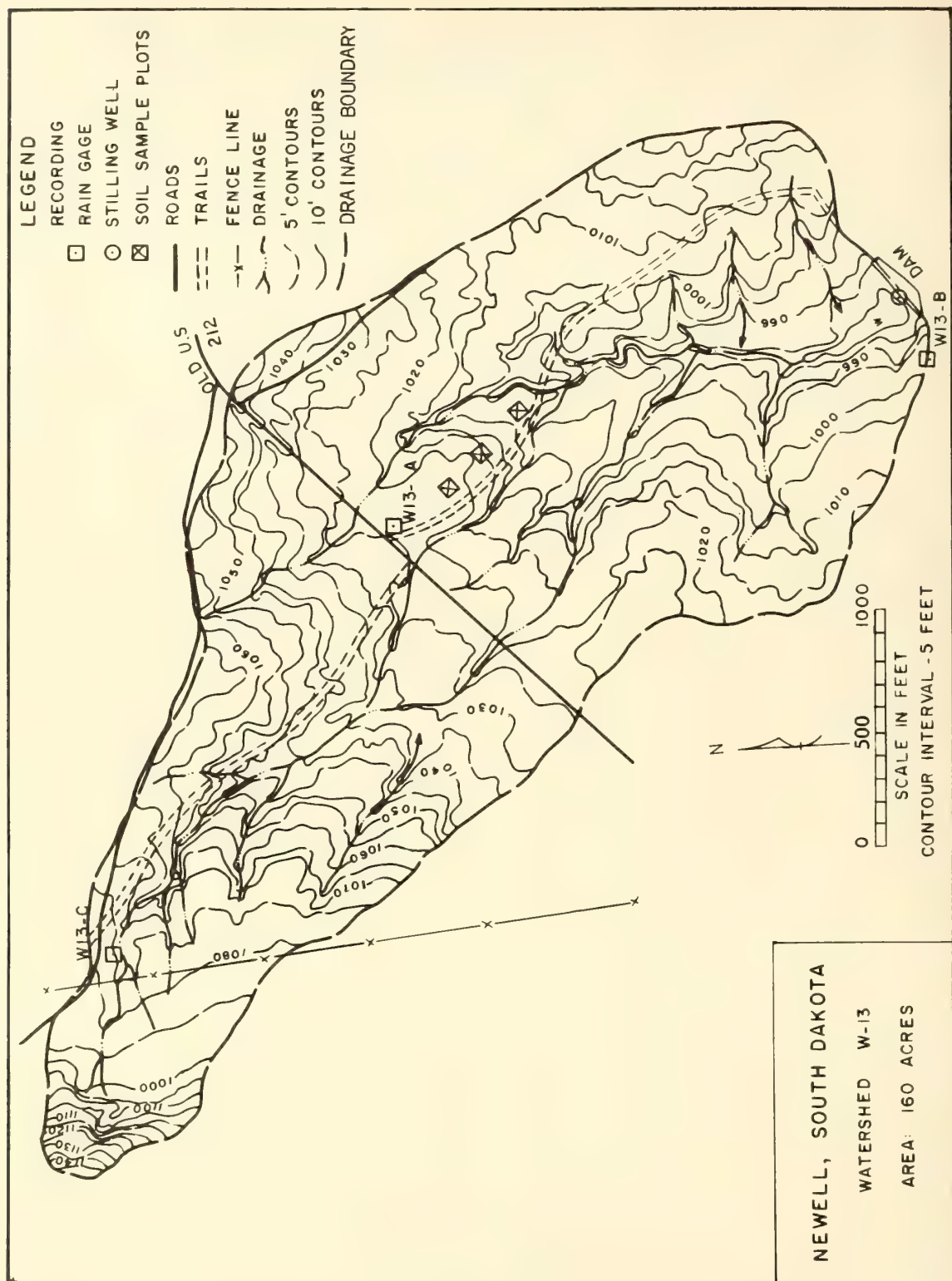
Notes: 1. Traveler departed prior to 10:00 AM on June 1, 1960. 2. (asphe)  
Normal 1000 on 12 year record (1947-1959) at Newell HWS station, Newell, South Dakota.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |                  |         |               |                  | Nevell, South Dakota Watershed W-13 |               |        |
|-----------------------------------------|---------------|------------------|---------|---------------|------------------|-------------------------------------|---------------|--------|
| Date                                    | Precipitation | Runoff <u>1/</u> | Date    | Precipitation | Runoff <u>1/</u> | Date                                | Precipitation | Runoff |
| 1958                                    |               |                  | 1959    |               |                  |                                     |               |        |
| 1-29 <u>2/</u>                          | 0.01          | 0                | 1-1     | 0.03          | 0                |                                     |               |        |
| 2-4                                     | .13           | 0                | 1-13    | .05           | 0                |                                     |               |        |
| 2-11 <u>3/</u>                          | .02           | 0                | 1-19    | .09           | 0                |                                     |               |        |
| 2-25                                    | .06           | 0                | 1-22    | .04           | 0                |                                     |               |        |
| 2-26                                    | .14           | .004             | 1-25    | .05           | 0                |                                     |               |        |
| 2-27                                    | .06           | 0                | 1-30,31 | .03           | 0                |                                     |               |        |
| 3-8                                     | .06           | .009             | 2-4     | .05           | 0                |                                     |               |        |
| 3-25                                    | .05           | 0                | 2-9     | .07           | 0                |                                     |               |        |
| 3-26                                    | .04           | 0                | 2-13    | .08           | 0                |                                     |               |        |
| 3-31                                    | .12           | 0                | 2-16,17 | .06           | 0                |                                     |               |        |
| 4-1                                     | .03           | .004             | 2-18,19 | .03           | 0                |                                     |               |        |
| 4-5                                     | .18           | 0                | 2-25,26 | .04           | 0                |                                     |               |        |
| 4-20                                    | .40           | .004             | 3-9     | .08           | .126 <u>4/</u>   |                                     |               |        |
| 4-21                                    | .18           | 0                | 3-10    | T             | .006             |                                     |               |        |
| 4-23                                    | .64           | 0                | 3-11    | 0             | .011             |                                     |               |        |
| 4-29                                    | 0             | .055             | 3-12    | .01           | .181             |                                     |               |        |
| 5-1                                     | .04           | 0                | 3-13    | .02           | .079             |                                     |               |        |
| 5-21                                    | .16           | 0                | 3-16    | 0             | .006             |                                     |               |        |
| 5-29                                    | .18           | 0                | 3-17    | 0             | .014             |                                     |               |        |
| 5-30                                    | .82           | 0                | 3-18    | .01           | .010             |                                     |               |        |
| 5-31                                    | .62           | 0                | 3-19    | .02           | 0                |                                     |               |        |
| 6-2                                     | .26           | .008             | 4-1     | .03           | 0                |                                     |               |        |
| 6-3                                     | .14           | .003             | 4-15    | .10           | 0                |                                     |               |        |
| 6-7                                     | .07           | .973             | 4-16    | .26           | 0                |                                     |               |        |
| 6-8                                     | .07           | .118             | 4-17    | .14           | 0                |                                     |               |        |
| 6-9                                     | .17           | .006             | 4-18    | T             | 0                |                                     |               |        |
| 6-12                                    | .18           | .003             | 4-19    | .12           | .009             |                                     |               |        |
| 6-13                                    | .24           | 0                | 4-20    | .05           | 0                |                                     |               |        |
| 6-14                                    | .73           | .064             | 4-25    | .04           | 0                |                                     |               |        |
| 6-15                                    | .30           | 0                | 5-4     | .06           | 0                |                                     |               |        |
| 6-21                                    | .15           | .072             | 5-5     | .05           | 0                |                                     |               |        |
| 7-4                                     | .12           | 0                | 5-10    | .07           | 0                |                                     |               |        |
| 7-10                                    | .12           | 0                | 5-18    | .41           | 0                |                                     |               |        |
| 7-12                                    | .12           | 0                | 5-19    | T             | .002             |                                     |               |        |
| 7-19                                    | .19           | 0                | 5-20    | .34           | .002             |                                     |               |        |
| 7-29                                    | .11           | 0                | 5-27    | .20           | 0                |                                     |               |        |
| 7-31                                    | .06           | 0                | 5-29    | .33           | .002             |                                     |               |        |
| 8-30                                    | .09           | .003             | 5-30    | .24           | .006             |                                     |               |        |
| 8-31                                    | .39           | 0                | 5-31    | .06           | 0                |                                     |               |        |
| 10-8                                    | .02           | 0                | 6-15    | .36           | T                |                                     |               |        |
| 10-20                                   | .06           | 0                | 6-24    | .36           | 0                |                                     |               |        |
| 10-21                                   | .76           | 0                | 6-25    | .08           | 0                |                                     |               |        |
| 10-31                                   | .05           | 0                | 6-26    | .06           | 0                |                                     |               |        |
| 11-8                                    | .06           | 0                | 6-29    | .21           | 0                |                                     |               |        |
| 11-13                                   | .25           | 0                | 6-30    | .87           | 0                |                                     |               |        |
| 11-20                                   | 0             | .009             | 7-3     | .06           | 0                |                                     |               |        |
| 11-20                                   | .02           | 0                | 7-15    | .28           | 0                |                                     |               |        |
| 12-11                                   | .05           | 0                | 7-16    | .40           | 0                |                                     |               |        |
| 12-14                                   | .10           | 0                | 7-21    | .03           | 0                |                                     |               |        |
| 12-22                                   | .02           | 0                | 8-1     | .10           | 0                |                                     |               |        |
|                                         |               |                  | 8-5     | .14           | 0                |                                     |               |        |
|                                         |               |                  | 8-12    | .02           | 0                |                                     |               |        |
|                                         |               |                  | 8-19    | .01           | 0                |                                     |               |        |
|                                         |               |                  | 9-16    | .37           | 0                |                                     |               |        |
|                                         |               |                  | 9-17    | .27           | 0                |                                     |               |        |
|                                         |               |                  | 9-18    | .05           | 0                |                                     |               |        |
|                                         |               |                  | 9-19    | .04           | 0                |                                     |               |        |
|                                         |               |                  | 9-20    | .05           | 0                |                                     |               |        |
|                                         |               |                  | 9-21    | .06           | 0                |                                     |               |        |
|                                         |               |                  | 9-24    | .27           | 0                |                                     |               |        |
|                                         |               |                  | 9-25    | .21           | .002             |                                     |               |        |
|                                         |               |                  | 9-27    | .02           | 0                |                                     |               |        |
|                                         |               |                  | 9-28,29 | .02           | 0                |                                     |               |        |
|                                         |               |                  | 10-7    | .11           | 0                |                                     |               |        |
|                                         |               |                  | 10-9    | .41           | T                |                                     |               |        |

Notes: Quality of records: Precipitation - good; Runoff - good except during winter months which is fair. Months of Jan., Feb., Mar., Apr., May, and Dec. include snow and snow melt. 1/ Runoff based on weekly observations during winter months. 2/ Start of observations. 3/ Recording raingages installed. 4/ Runoff between observation dates.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       | Newell, South Dakota Watershed 11-12 |        |      |               |        |
|-----------------------------------------|---------------|--------|-------|--------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation                        | Runoff | Date | Precipitation | Runoff |
|                                         |               |        | 10-9  |                                      |        |      |               |        |
|                                         |               |        | 10-12 | .01                                  | 0      |      |               |        |
|                                         |               |        | 10-15 | .01                                  | 0      |      |               |        |
|                                         |               |        | 10-21 | .00                                  | 0      |      |               |        |
|                                         |               |        | 10-25 | .09                                  | 0      |      |               |        |
|                                         |               |        | 10-27 | .01                                  | 0      |      |               |        |
|                                         |               |        | 10-30 | .01                                  | 0      |      |               |        |
|                                         |               |        | 11-1  | .10                                  | 0      |      |               |        |
|                                         |               |        | 11-5  |                                      | 0      |      |               |        |
|                                         |               |        | 11-10 | .01                                  | 0      |      |               |        |
|                                         |               |        | 11-11 | .08                                  | 0      |      |               |        |
|                                         |               |        | 11-12 | .00                                  | 0      |      |               |        |
|                                         |               |        | 11-17 | .01                                  | 0      |      |               |        |
|                                         |               |        | 11-18 | .12                                  | 0      |      |               |        |
|                                         |               |        | 11-21 | .02                                  | 0      |      |               |        |
|                                         |               |        | 11-22 | .02                                  | 0      |      |               |        |
|                                         |               |        | 11-23 | .35                                  | 0      |      |               |        |
|                                         |               |        | 11-24 | .04                                  | 0      |      |               |        |
|                                         |               |        | 11-26 | .02                                  | 0      |      |               |        |
|                                         |               |        | 11-28 | .01                                  | 0      |      |               |        |
|                                         |               |        | 11-29 | .01                                  | 0      |      |               |        |
|                                         |               |        | 11-31 | .02                                  | 0      |      |               |        |
| Notes:                                  |               |        |       |                                      |        |      |               |        |





1. 2

Internal drainage - very slow.

10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846.

Form 10, page 2. Do not fill in unless you are a partner. • Early precipitation records

170: Degree of grazing of non-lawn: 1957 - moderate; 1958 - moderate; 1959 - moderate.

3. N. BAILY (1954, 1961) : *Baccharis* in Pierre Shale Plains, particularly eastward in 1<sup>st</sup>-10<sup>th</sup> mm precipitation area.  
Pierre Shale Plains and Badlands land resource area (5-10).

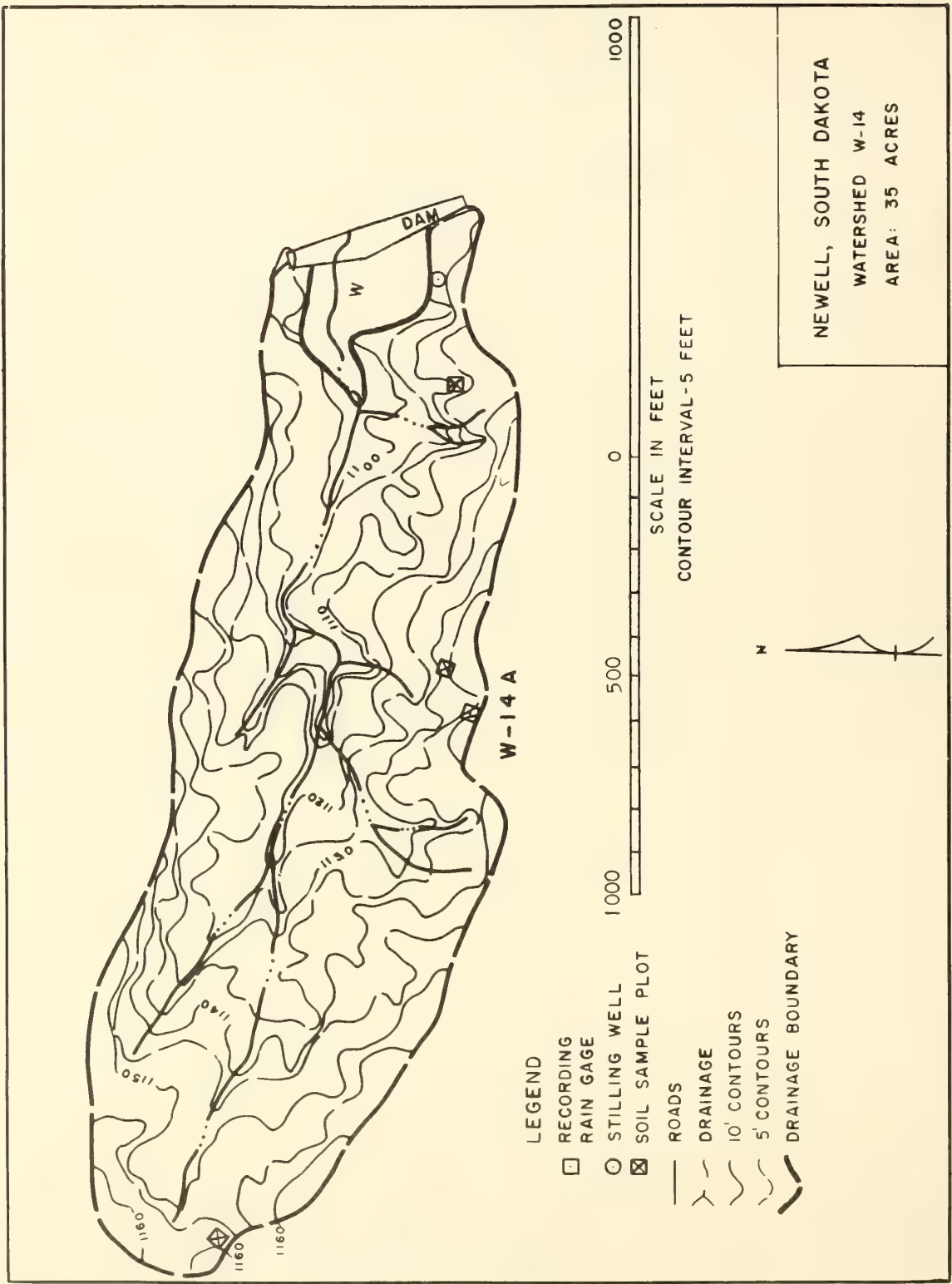
Notes: 1 - Deposited on receipt on or to 4-1-5 on Mid-Pool note.  
Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.

| DAILY PRECIPITATION AND RUNOFF (Inches) |                             |                    |         |               | Novell, South Dakota Watershed W-34 |      |               |        |
|-----------------------------------------|-----------------------------|--------------------|---------|---------------|-------------------------------------|------|---------------|--------|
| Date                                    | Precipitation <sup>2/</sup> | Runoff             | Date    | Precipitation | Runoff                              | Date | Precipitation | Runoff |
| 1958                                    |                             |                    | 1959    |               |                                     |      |               |        |
| 2-21 <sup>1/</sup>                      | 0.25                        | 0                  | 1-1     | .05           | 0                                   |      |               |        |
| 3-6                                     | .25                         | 0                  | 1-4,5   | .10           | 0                                   |      |               |        |
| 3-11                                    | .01                         | 0                  | 1-13    | .05           | 0                                   |      |               |        |
| 4-3 <sup>1/</sup>                       | 1.00                        | .017 <sup>3/</sup> | 1-25    | .04           | 0                                   |      |               |        |
| 4-5                                     | .08                         | 0                  | 2-3     | .01           | 0                                   |      |               |        |
| 4-6                                     | .08                         | 0                  | 2-5     | .01           | 0                                   |      |               |        |
| 4-11                                    | 0                           | .024 <sup>3/</sup> | 2-9     | .01           | 0                                   |      |               |        |
| 4-18                                    | 0                           | 0                  | 2-13    | .01           | 0                                   |      |               |        |
| 4-21                                    | .06                         | 0                  | 2-16,17 | .04           | 0                                   |      |               |        |
| 4-22                                    | .10                         | 0                  | 2-24    | 0             | .092                                |      |               |        |
| 4-23                                    | .10                         | 0                  | 2-26    | .04           | 0                                   |      |               |        |
| 4-24                                    | .10                         | 0                  | 3-6     | 0             | .142                                |      |               |        |
| 4-25                                    | .10                         | 0                  | 3-9     | .05           | 0                                   |      |               |        |
| 4-26                                    | .10                         | 0                  | 3-12,13 | .03           | 0                                   |      |               |        |
| 4-28                                    | .10                         | 0                  | 3-19    | .03           | 0                                   |      |               |        |
| 4-29                                    | 0                           | .046 <sup>3/</sup> | 3-24    | .04           | 0                                   |      |               |        |
| 5-7                                     | .12                         | 0                  | 4-2     | .10           | 0                                   |      |               |        |
| 5-30                                    | .51                         | 0                  | 4-15    | .03           | 0                                   |      |               |        |
| 5-31                                    | .02                         | 0                  | 4-16    | .32           | 0                                   |      |               |        |
| 6-1                                     | .73                         | 0                  | 4-19    | .17           | .016                                |      |               |        |
| 6-2                                     | .86                         | 0                  | 4-20    | .08           | .006                                |      |               |        |
| 6-3                                     | .11                         | 0                  | 4-22    | 0             | .033                                |      |               |        |
| 6-4                                     | .04                         | 0                  | 4-25    | .04           | .003                                |      |               |        |
| 6-5                                     | 0                           | .006 <sup>3/</sup> | 4-26    | 0             | .003                                |      |               |        |
| 6-7 <sup>5/</sup>                       | .71 <sup>6/</sup>           | .012               | 5-4     | .14           | 0                                   |      |               |        |
| 6-8                                     | .26                         | .083               | 5-5     | .05           | 0                                   |      |               |        |
| 6-9                                     | 0                           | .004               | 5-6     | T             | 0                                   |      |               |        |
| 6-11                                    | .47                         | .007               | 5-9     | .04           | 0                                   |      |               |        |
| 6-12                                    | .27                         | .014               | 5-10    | .04           | 0                                   |      |               |        |
| 6-13                                    | .07                         | .035               | 5-11    | .02           | 0                                   |      |               |        |
| 6-14                                    | .82                         | .344               | 5-16    | .18           | 0                                   |      |               |        |
| 6-15                                    | .11                         | 0                  | 5-17    | T             | 0                                   |      |               |        |
| 6-16                                    | .02                         | 0                  | 5-18    | T             | 0                                   |      |               |        |
| 6-18                                    | .06                         | 0                  | 5-19    | .32           | 0                                   |      |               |        |
| 6-19                                    | .04                         | 0                  | 5-20    | .29           | .012                                |      |               |        |
| 6-20                                    | .10                         | 0                  | 5-24    | T             | 0                                   |      |               |        |
| 7-3                                     | 3.04                        | .948               | 5-25    | .05           | 0                                   |      |               |        |
| 7-4                                     | .16                         | .013               | 5-26    | .03           | 0                                   |      |               |        |
| 7-10                                    | .97                         | .167               | 5-27    | .03           | 0                                   |      |               |        |
| 7-12                                    | .31                         | 0                  | 5-29    | .56           | 0                                   |      |               |        |
| 7-18                                    | .11                         | 0                  | 5-30    | .44           | .012                                |      |               |        |
| 7-19                                    | .19                         | 0                  | 5-31    | .17           | .006                                |      |               |        |
| 7-24                                    | .10                         | 0                  | 6-1     | .04           | 0                                   |      |               |        |
| 7-29                                    | .08                         | 0                  | 6-14    | .04           | 0                                   |      |               |        |
| 7-30                                    | .12                         | 0                  | 6-17    | T             | 0                                   |      |               |        |
| 8-5                                     | .45                         | 0                  | 6-21    | .18           | 0                                   |      |               |        |
| 8-30                                    | .17                         | 0                  | 6-23    | .17           | 0                                   |      |               |        |
| 9-24                                    | .10                         | 0                  | 6-24    | .08           | 0                                   |      |               |        |
| 10-8                                    | .04                         | 0                  | 6-25    | .20           | 0                                   |      |               |        |
| 10-20                                   | .11                         | 0                  | 6-26    | .04           | 0                                   |      |               |        |
| 10-21                                   | .33                         | 0                  | 6-27    | .04           | 0                                   |      |               |        |
| 10-30                                   | .03                         | 0                  | 6-28    | .10           | 0                                   |      |               |        |
| 11-14                                   | .20                         | 0                  | 6-29    | .24           | 0                                   |      |               |        |
| 11-15                                   | .02                         | 0                  | 6-30    | .30           | .007                                |      |               |        |
| 11-16                                   | .13                         | .014               | 6-31    | 0             | .010                                |      |               |        |
| 11-17                                   | .08                         | .003               | 7-3     | .16           | .010                                |      |               |        |
| 11-23                                   | .02                         | 0                  | 7-7     | .04           | 0                                   |      |               |        |
| 12-4                                    | .07                         | 0                  | 7-15    | .46           | .003                                |      |               |        |
| 12-7                                    | .03                         | 0                  | 7-17    | .23           | .003                                |      |               |        |
| 12-12                                   | .06                         | .012               | 8-7     | .02           | 0                                   |      |               |        |
|                                         |                             |                    | 8-11    | .18           | 0                                   |      |               |        |
|                                         |                             |                    | 8-25    | .03           | 0                                   |      |               |        |
|                                         |                             |                    | 9-16    | .80           | .004                                |      |               |        |
|                                         |                             |                    | 9-17    | .30           | .002                                |      |               |        |
|                                         |                             |                    | 9-18    | .03           | 0                                   |      |               |        |

Notes: Quality of record: 1/ Start of observations. 2/ Precipitation prior to 4-1-58 from Anderson gauge. 3/ Runoff between observation dates. 4/ Rain gauge installed. 5/ Tare recorder installed. 6/ Fast storm.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |          | Newell, South Dakota Watershed W-11 |        |      |               |        |
|-----------------------------------------|---------------|--------|----------|-------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date     | Precipitation                       | Runoff | Date | Precipitation | Runoff |
|                                         |               |        | 1959     |                                     |        |      |               |        |
|                                         |               |        | 9-20     | .02                                 | 0      |      |               |        |
|                                         |               |        | 9-21     | .02                                 | 0      |      |               |        |
|                                         |               |        | 9-24     | .63                                 | .003   |      |               |        |
|                                         |               |        | 9-25     | .18                                 | .009   |      |               |        |
|                                         |               |        | 9-28     | .04                                 | 0      |      |               |        |
|                                         |               |        | 10-1     | .05                                 | 0      |      |               |        |
|                                         |               |        | 10-7     | .04                                 | 0      |      |               |        |
|                                         |               |        | 10-9     | .23                                 | 0      |      |               |        |
|                                         |               |        | 10-12    | .03                                 | 0      |      |               |        |
|                                         |               |        | 10-25    | .10                                 | 0      |      |               |        |
|                                         |               |        | 11-4     | .07                                 | 0      |      |               |        |
|                                         |               |        | 11-6     | 0                                   | .019   |      |               |        |
|                                         |               |        | 11-11,16 | .15                                 | 0      |      |               |        |
|                                         |               |        | 11-18    | 0                                   | 0      |      |               |        |
|                                         |               |        | 11-21,22 | .44                                 | 0      |      |               |        |
|                                         |               |        | 11-30    | 0                                   | .049   |      |               |        |
|                                         |               |        | 12-3,4   | .03                                 | 0      |      |               |        |
|                                         |               |        | 12-14    | 0                                   | .008   |      |               |        |
|                                         |               |        | 12-20,21 | .06                                 | 0      |      |               |        |
|                                         |               |        | 12-27    | .02                                 | 0      |      |               |        |
|                                         |               |        | 12-31    | .02                                 | 0      |      |               |        |
| Notes:                                  |               |        |          |                                     |        |      |               |        |





1917. Jan. 1. 1917.

... ..

Rate of erosion of nitrate: 1957 - moderate; 1958 - moderate; 1959 - moderate.

MONTHLY PRECIPITATION AND RUNOFF (Inches)

Navell, South Carota attached - 15

Notes:

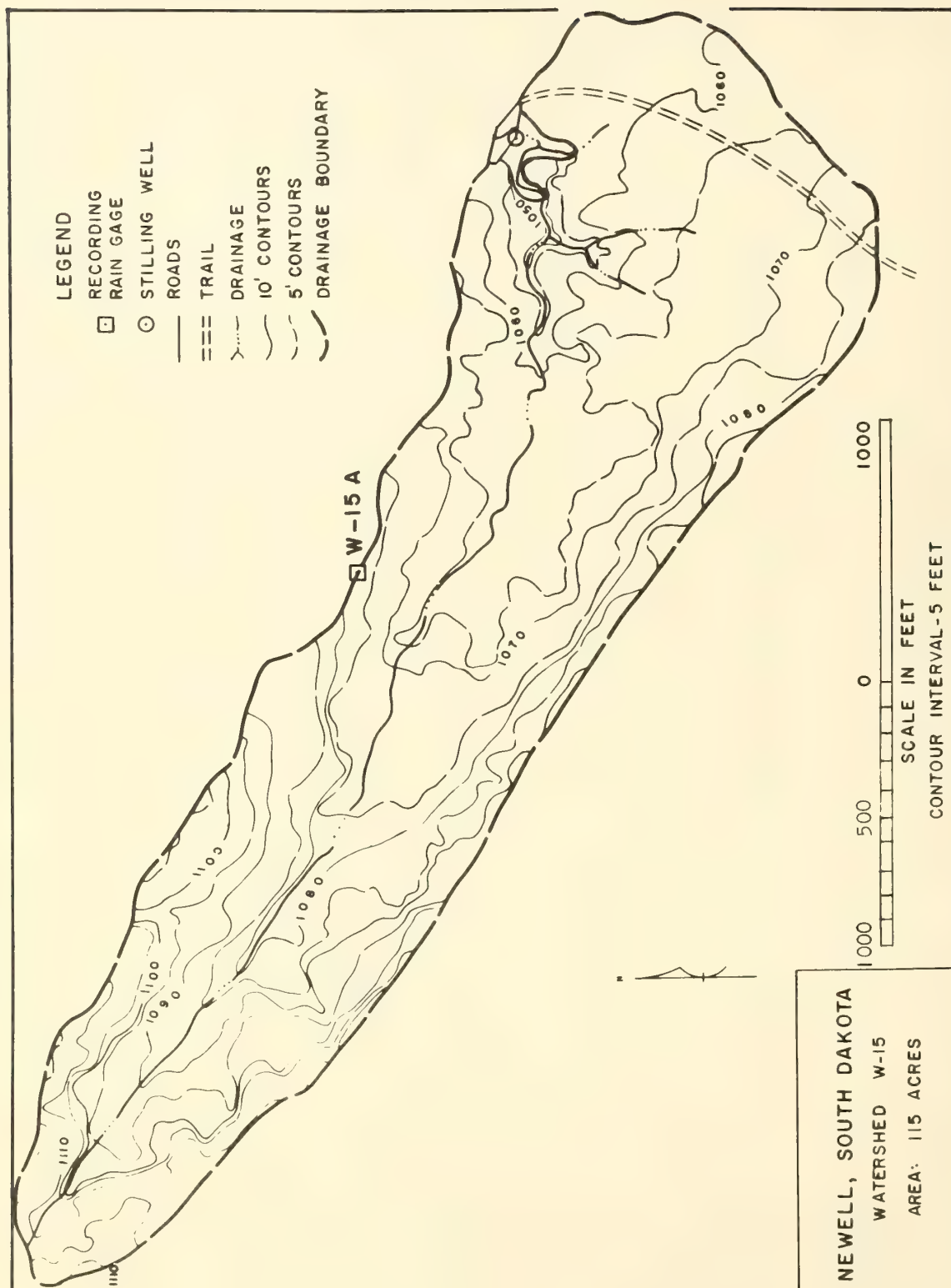
Normal: F based on 32 year record (1906-1999) at Newell USWB station, Newell, North Dakota.

| DAILY PRECIPITATION AND RUNOFF (Inches) |                    |                    |          | Newell, South Dakota Watershed W-15 |                    |      |               |        |
|-----------------------------------------|--------------------|--------------------|----------|-------------------------------------|--------------------|------|---------------|--------|
| Date                                    | Precipitation      | Runoff             | Date     | Precipitation                       | Runoff             | Date | Precipitation | Runoff |
| 1958                                    |                    |                    | 1959     |                                     |                    |      |               |        |
| 2-21 <sup>1/</sup>                      | .25                | 0                  | 1-1      | .05                                 | 0                  |      |               |        |
| 3-3                                     | .25                | 0                  | 1-11     | .04                                 | 0                  |      |               |        |
| 3-6                                     | 0                  | .07 <sup>2/</sup>  | 1-5      | .06                                 | 0                  |      |               |        |
| 3-12                                    | .01                | 0                  | 1-13     | .05                                 | 0                  |      |               |        |
| 3-16 <sup>4/</sup>                      | T <sup>2/</sup>    | 0                  | 1-19     | .05                                 | 0                  |      |               |        |
| 4-3                                     | 1.00               | .002 <sup>2/</sup> | 1-22     | .05                                 | 0                  |      |               |        |
| 4-11                                    | .16                | 0                  | 1-24     | .05                                 | 0                  |      |               |        |
| 4-29                                    | .66                | .20 <sup>1/</sup>  | 2-2      | .02                                 | 0                  |      |               |        |
| 5-15                                    | .15                | 0                  | 2-5      | .03                                 | 0                  |      |               |        |
| 5-24                                    | T                  | 0                  | 2-9      | .03                                 | 0                  |      |               |        |
| 5-27                                    | .10                | 0                  | 2-13     | .01                                 | 0                  |      |               |        |
| 5-30                                    | .25                | 0                  | 2-16, 17 | .03                                 | 0                  |      |               |        |
| 6-1                                     | .03                | 0                  | 2-25, 26 | .04                                 | 0                  |      |               |        |
| 6-2                                     | .70                | 0                  | 3-9      | .05                                 | 0                  |      |               |        |
| 6-3                                     | .65                | 0                  | 3-10     | 0                                   | .04 <sup>1/4</sup> |      |               |        |
| 6-4                                     | .01                | 0                  | 3-11     | 0                                   | .004               |      |               |        |
| 6-7                                     | 1.15               | .003               | 3-12     | .01                                 | .012               |      |               |        |
| 6-8                                     | .22                | .155               | 3-13     | .02                                 | .006               |      |               |        |
| 6-9                                     | .02                | 0                  | 3-17     | 0                                   | .023               |      |               |        |
| 6-11                                    | .46                | .013               | 3-24     | .04                                 | 0                  |      |               |        |
| 6-12                                    | .75                | .041               | 4-2      | .12                                 | 0                  |      |               |        |
| 6-13                                    | .01                | .017               | 4-15     | .10                                 | .003               |      |               |        |
| 6-14                                    | .50                | .27 <sup>1/4</sup> | 4-16     | .30                                 | .001               |      |               |        |
| 6-15                                    | .12                | 0                  | 4-17     | T                                   | 0                  |      |               |        |
| 6-19                                    | .10                | 0                  | 4-18     | .03                                 | T                  |      |               |        |
| 6-20                                    | .17                | 0                  | 4-19     | .17                                 | .005               |      |               |        |
| 6-21                                    | .02                | 0                  | 4-20     | .12                                 | .011               |      |               |        |
| 7-3                                     | 3.5 <sup>1/4</sup> | 1.025              | 4-22     | 0                                   | .040               |      |               |        |
| 7-4                                     | .04                | .016               | 4-25     | .04                                 | 0                  |      |               |        |
| 7-10                                    | .67                | .141               | 5-4      | .14                                 | .002               |      |               |        |
| 7-12                                    | .33                | 0                  | 5-5      | .08                                 | 0                  |      |               |        |
| 7-18                                    | .15                | 0                  | 5-6      | .07                                 | 0                  |      |               |        |
| 7-19                                    | .16                | 0                  | 5-9      | .04                                 | .002               |      |               |        |
| 7-24                                    | .17                | 0                  | 5-10     | .04                                 | 0                  |      |               |        |
| 7-29                                    | .23                | 0                  | 5-11     | .02                                 | 0                  |      |               |        |
| 7-30                                    | .13                | 0                  | 5-16     | .18                                 | 0                  |      |               |        |
| 8-5                                     | .45                | 0                  | 5-19     | .32                                 | 0                  |      |               |        |
| 8-29                                    | .05                | 0                  | 5-20     | .29                                 | .009               |      |               |        |
| 8-30                                    | .15                | 0                  | 5-25     | .05                                 | .004               |      |               |        |
| 9-24                                    | .08                | 0                  | 5-27     | .06                                 | 0                  |      |               |        |
| 10-8                                    | .10                | .005               | 5-29     | .62                                 | 0                  |      |               |        |
| 10-20                                   | .11                | 0                  | 5-30     | .38                                 | .008               |      |               |        |
| 10-21                                   | .33                | 0                  | 5-31     | .15                                 | 0                  |      |               |        |
| 11-6                                    | .03                | 0                  | 6-1      | .01                                 | 0                  |      |               |        |
| 11-14                                   | .20                | 0                  | 6-14     | .03                                 | 0                  |      |               |        |
| 11-15                                   | .02                | 0                  | 6-21     | .23                                 | 0                  |      |               |        |
| 11-16                                   | .13                | .013               | 6-23     | .20                                 | T                  |      |               |        |
| 11-17                                   | .10                | .002               | 6-24     | .12                                 | 0                  |      |               |        |
| 11-23                                   | .02                | .003               | 6-25     | .34                                 | 0                  |      |               |        |
| 12-1                                    | .07                | .025               | 6-26     | .03                                 | 0                  |      |               |        |
| 12-7                                    | .03                | 0                  | 6-27     | .07                                 | 0                  |      |               |        |
| 12-11                                   | .08                | 0                  | 6-28     | .10                                 | 0                  |      |               |        |
|                                         |                    |                    | 6-29     | .24                                 | T                  |      |               |        |
|                                         |                    |                    | 6-30     | .19                                 | .004               |      |               |        |
|                                         |                    |                    | 7-3      | .22                                 | 0                  |      |               |        |
|                                         |                    |                    | 7-7      | .08                                 | 0                  |      |               |        |
|                                         |                    |                    | 7-15     | .57                                 | 0                  |      |               |        |
|                                         |                    |                    | 7-17     | .15                                 | T                  |      |               |        |
|                                         |                    |                    | 8-1      | .18                                 | 0                  |      |               |        |
|                                         |                    |                    | 8-7      | .08                                 | 0                  |      |               |        |
|                                         |                    |                    | 8-25     | .03                                 | 0                  |      |               |        |
|                                         |                    |                    | 9-16     | .82                                 | .018               |      |               |        |
|                                         |                    |                    | 9-17     | .31                                 | .005               |      |               |        |
|                                         |                    |                    | 9-18     | .04                                 | 0                  |      |               |        |
|                                         |                    |                    | 9-20     | .01                                 | 0                  |      |               |        |

Notes: 1/ Starting observation date. 2/ Precipitation record prior to 4-1-58 from Anderson gage. 3/ Runoff between observation dates. 4/ Recording rain gauge installed. Months of Jan., Feb., Mar. Apr., Nov. and Dec. include snow and snow melt. Quality of records: Precipitation - good. Runoff - good, except for period before 5-6-58 which is fair.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       | Newell, South Dakota Watershed W-15 |        |      |               |        |
|-----------------------------------------|---------------|--------|-------|-------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation                       | Runoff | Date | Precipitation | Runoff |
|                                         |               |        | 1959  |                                     |        |      |               |        |
|                                         |               |        | 9-21  | .03                                 | 0      |      |               |        |
|                                         |               |        | 9-24  | .68                                 | .005   |      |               |        |
|                                         |               |        | 9-25  | .19                                 | .004   |      |               |        |
|                                         |               |        | 9-26  | .04                                 | .003   |      |               |        |
|                                         |               |        | 9-29  | .01                                 | 0      |      |               |        |
|                                         |               |        | 10-1  | .07                                 | .001   |      |               |        |
|                                         |               |        | 10-7  | .06                                 | .002   |      |               |        |
|                                         |               |        | 10-9  | .29                                 | .007   |      |               |        |
|                                         |               |        | 10-12 | .04                                 | 0      |      |               |        |
|                                         |               |        | 10-26 | .11                                 | .002   |      |               |        |
|                                         |               |        | 11-4  | .22                                 | .002   |      |               |        |
|                                         |               |        | 11-12 | .03                                 | .002   |      |               |        |
|                                         |               |        | 11-13 | .06                                 | 0      |      |               |        |
|                                         |               |        | 11-14 | .05                                 | 0      |      |               |        |
|                                         |               |        | 11-15 | .01                                 | 0      |      |               |        |
|                                         |               |        | 11-17 | .16                                 | 0      |      |               |        |
|                                         |               |        | 11-18 | .03                                 | 0      |      |               |        |
|                                         |               |        | 11-21 | .06                                 | 0      |      |               |        |
|                                         |               |        | 11-22 | .07                                 | 0      |      |               |        |
|                                         |               |        | 11-23 | .34                                 | 0      |      |               |        |
|                                         |               |        | 11-25 | .02                                 | .024   |      |               |        |
|                                         |               |        | 12-3  | .00                                 | 0      |      |               |        |
|                                         |               |        | 12-4  | .01                                 | 0      |      |               |        |
|                                         |               |        | 12-20 | .02                                 | 0      |      |               |        |
|                                         |               |        | 12-21 | .05                                 | 0      |      |               |        |
|                                         |               |        | 12-27 | .02                                 | 0      |      |               |        |
|                                         |               |        | 12-28 | .01                                 | 0      |      |               |        |
|                                         |               |        | 12-31 | .02                                 | 0      |      |               |        |
| Notes:                                  |               |        |       |                                     |        |      |               |        |





Meade County, S. D.; 49 mi. SE of Newell;

Drainage - Medium.

(Internal)

[Faint text, possibly a title or description]

[Faint text, possibly a note or description]

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

[Faint text, possibly a date or location]

| Month<br>Year | Jan | Feb | Mar | Apr  | May  | June | July | Aug  | Sept | Oct  | Nov | Dec | Year  |
|---------------|-----|-----|-----|------|------|------|------|------|------|------|-----|-----|-------|
| 1951          | 0.0 | 0.0 | 0.0 | 1.0  | 1.0  | 1.0  | 1.0  | 1.0  | 0.5  | 0.0  | 0.0 | 0.0 | 11.0  |
| 1952          | 0.0 | 0.0 | 0.0 | 1.0  | 1.0  | 1.0  | 1.0  | 1.0  | 0.5  | 0.0  | 0.0 | 0.0 | 11.0  |
| Normal        | 0.0 | 0.0 | 0.0 | 1.67 | 2.65 | 2.95 | 3.11 | 1.54 | 1.29 | 1.08 | .55 | .39 | 15.57 |

Notes: 1/ Precipitation prior to 1951 from Gossard's data.

2/ Precipitation with recorded station at Newell.

Normal P based on 52 year record (1908-1959) at Newell USWB station, Newell, South Dakota.

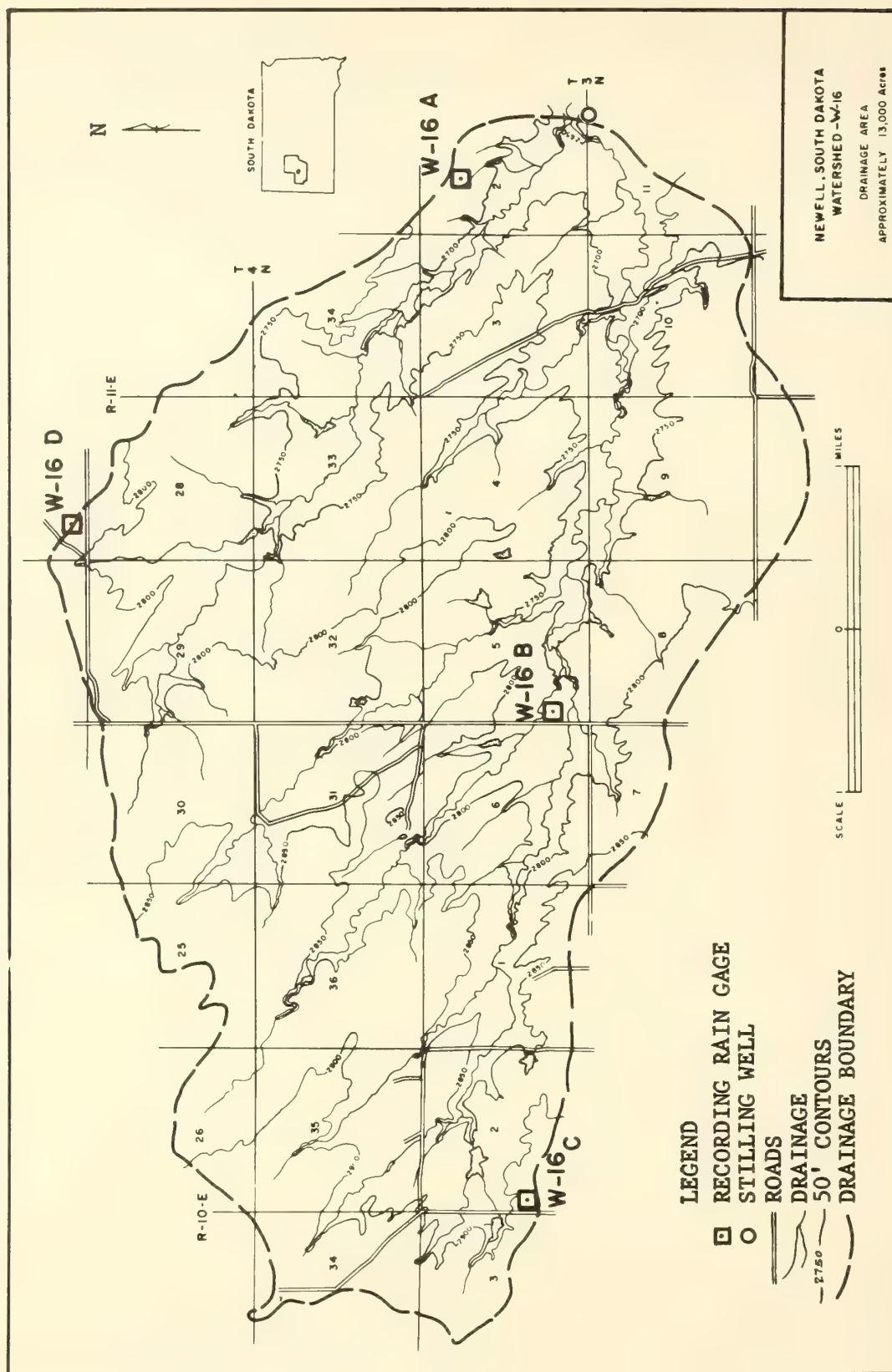
Cooperative Research project of USDA and South Dakota Agricultural Experiment Station

| DAILY PRECIPITATION AND RUNOFF (Inches) |                         |                  |       |               |        | Newell, South Dakota Watershed W-16 |               |        |
|-----------------------------------------|-------------------------|------------------|-------|---------------|--------|-------------------------------------|---------------|--------|
| Date                                    | Precipitation <u>1/</u> | Runoff <u>2/</u> | Date  | Precipitation | Runoff | Date                                | Precipitation | Runoff |
| 1958                                    |                         |                  | 1959  |               |        |                                     |               |        |
| 1-16 <u>3/</u>                          | T                       | 0                | 1-11  | .03           | 0      |                                     |               |        |
| 2-25                                    | .05                     | 0                | 1-16  | .01           | 0      |                                     |               |        |
| 3-11 <u>4/</u>                          | 0                       | .029             | 1-18  | .15           | 0      |                                     |               |        |
| 3-23                                    | .10                     | .004             | 1-25  | .01           | 0      |                                     |               |        |
| 3-30                                    | 0                       | .006             | 2-1   | .03           | 0      |                                     |               |        |
| 4-1                                     | .15                     | 0                | 2-12  | .08           | 0      |                                     |               |        |
| 4-2                                     | .23                     | 0                | 2-13  | .08           | 0      |                                     |               |        |
| 4-3                                     | .28                     | .027             | 2-21  | .06           | 0      |                                     |               |        |
| 4-11                                    | .09                     | 0                | 2-27  | .01           | .018   |                                     |               |        |
| 4-13 <u>5/</u>                          | .11                     | 0                | 2-28  | 0             | .002   |                                     |               |        |
| 4-20                                    | .01                     | 0                | 3-1   | .03           | .001   |                                     |               |        |
| 4-23                                    | .16                     | .119             | 3-11  | 0             | .001   |                                     |               |        |
| 4-27                                    | .06                     | .007             | 3-5   | 0             | .001   |                                     |               |        |
| 4-30                                    | .08                     | .004             | 3-8   | 0             | .001   |                                     |               |        |
| 5-4                                     | .02                     | 0                | 3-9   | 0             | .001   |                                     |               |        |
| 5-17                                    | .18                     | T                | 3-10  | 0             | .001   |                                     |               |        |
| 5-30                                    | 1.00                    | T                | 3-11  | 0             | .001   |                                     |               |        |
| 5-31                                    | .16                     | T                | 3-21  | .08           | 0      |                                     |               |        |
| 6-1                                     | .25                     | 0                | 4-10  | .15           | 0      |                                     |               |        |
| 6-4                                     | .02                     | 0                | 4-12  | .01           | 0      |                                     |               |        |
| 6-7                                     | .55                     | 0                | 4-16  | .12           | .005   |                                     |               |        |
| 6-8                                     | 1.81                    | .073             | 4-17  | 0             | .001   |                                     |               |        |
| 6-9                                     | .31                     | .011             | 4-18  | 0             | .009   |                                     |               |        |
| 6-10                                    | 0                       | T                | 4-19  | 0             | .008   |                                     |               |        |
| 6-11                                    | .18                     | T                | 4-20  | 1.00          | .004   |                                     |               |        |
| 6-12                                    | .25                     | T                | 4-26  | .03           | 0      |                                     |               |        |
| 6-13                                    | .16                     | .002             | 5-3   | .10           | .002   |                                     |               |        |
| 6-14                                    | 0                       | .005             | 5-1   | .81           | .012   |                                     |               |        |
| 6-15                                    | .15                     | .006             | 5-4   | 0             | .022   |                                     |               |        |
| 6-20                                    | .16                     | 0                | 5-10  | .06           | 0      |                                     |               |        |
| 6-21                                    | .17                     | 0                | 5-18  | .14           | 0      |                                     |               |        |
| 7-2                                     | .31                     | 0                | 5-20  | .59           | T      |                                     |               |        |
| 7-3                                     | .18                     | 0                | 5-21  | .05           | 0      |                                     |               |        |
| 7-6                                     | .01                     | 0                | 5-27  | .50           | 0      |                                     |               |        |
| 7-11                                    | .25                     | 0                | 5-29  | .09           | 0      |                                     |               |        |
| 7-19                                    | .21                     | 0                | 5-30  | .12           | .017   |                                     |               |        |
| 7-29                                    | .08                     | 0                | 5-31  | 0             | .002   |                                     |               |        |
| 7-30                                    | .16                     | 0                | 6-2   | .37           | 0      |                                     |               |        |
| 7-31                                    | .01                     | 0                | 6-11  | .05           | 0      |                                     |               |        |
| 8-2                                     | .01                     | 0                | 6-15  | .03           | 0      |                                     |               |        |
| 8-11                                    | .11                     | 0                | 6-16  | .03           | 0      |                                     |               |        |
| 8-14                                    | .63                     | 0                | 6-20  | .06           | 0      |                                     |               |        |
| 8-23                                    | .12                     | 0                | 6-21  | .06           | 0      |                                     |               |        |
| 9-9                                     | .35                     | 0                | 6-25  | .08           | 0      |                                     |               |        |
| 9-13                                    | .08                     | 0                | 6-26  | .29           | 0      |                                     |               |        |
| 10-20                                   | .25                     | 0                | 6-27  | .23           | 0      |                                     |               |        |
| 10-21                                   | .10                     | 0                | 6-28  | .11           | 0      |                                     |               |        |
| 10-22                                   | .08                     | 0                | 6-29  | .31           | .008   |                                     |               |        |
| 11-11                                   | .08                     | 0                | 6-30  | .15           | 0      |                                     |               |        |
| 11-15                                   | .02                     | 0                | 7-3   | .29           | .002   |                                     |               |        |
| 11-16                                   | .04                     | 0                | 7-9   | .02           | 0      |                                     |               |        |
| 11-21                                   | .02                     | 0                | 7-15  | .72           | .001   |                                     |               |        |
| 11-21                                   | .01                     | 0                | 7-16  | .21           | 0      |                                     |               |        |
| 12-1                                    | .03                     | 0                | 7-22  | .01           | 0      |                                     |               |        |
| 12-7                                    | .03                     | 0                | 8-14  | .55           | 0      |                                     |               |        |
| 12-8                                    | .02                     | 0                | 9-17  | .14           | .001   |                                     |               |        |
| 12-11                                   | .01                     | 0                | 9-18  | .22           | .002   |                                     |               |        |
|                                         |                         |                  | 9-19  | 0             | .003   |                                     |               |        |
|                                         |                         |                  | 9-20  | .01           | 0      |                                     |               |        |
|                                         |                         |                  | 9-21  | .31           | .017   |                                     |               |        |
|                                         |                         |                  | 9-25  | .01           | 0      |                                     |               |        |
|                                         |                         |                  | 10-1  | .13           | 0      |                                     |               |        |
|                                         |                         |                  | 10-18 | .03           | 0      |                                     |               |        |
|                                         |                         |                  | 10-26 | .02           | 0      |                                     |               |        |
|                                         |                         |                  | 11-1  | .18           | 0      |                                     |               |        |

Notes: Quantity of records: Precipitation - fair except for period before 4-13-58 which is poor. Runoff - good. Months of Jan., Feb., Mar., Apr., May, and Dec. include snow and snow melt. 1/ Precipitation prior to 4-13-58 from Gossard's gage. 2/ Runoff prior to 3-11-58 based on weekly observations. 3/ Resumption of observations. 4/ State recorder installed. 5/ Recording raingages installed.

| DAILY PRECIPITATION AND RUNOFF (Inches) |               |        |       | Neveall, South Dakota Watershed M-16 |        |      |               |        |
|-----------------------------------------|---------------|--------|-------|--------------------------------------|--------|------|---------------|--------|
| Date                                    | Precipitation | Runoff | Date  | Precipitation                        | Runoff | Date | Precipitation | Runoff |
|                                         |               |        | 1959  |                                      |        |      |               |        |
|                                         |               |        | 11-10 | .10                                  | 0      |      |               |        |
|                                         |               |        | 11-11 | .20                                  | 0      |      |               |        |
|                                         |               |        | 11-12 | .12                                  | 0      |      |               |        |
|                                         |               |        | 11-15 | .08                                  | 0      |      |               |        |
|                                         |               |        | 11-20 | .05                                  | 0      |      |               |        |
|                                         |               |        | 11-21 | .10                                  | T      |      |               |        |
|                                         |               |        | 11-24 | 0                                    | .015   |      |               |        |
|                                         |               |        | 11-24 | .01                                  | 0      |      |               |        |
|                                         |               |        | 11-27 | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-3  | .05                                  | 0      |      |               |        |
|                                         |               |        | 12-01 | .02                                  | 0      |      |               |        |
|                                         |               |        | 12-18 | .01                                  | 0      |      |               |        |
|                                         |               |        | 12-26 | .02                                  | 0      |      |               |        |
| Notes:                                  |               |        |       |                                      |        |      |               |        |





MOOREFIELD, WEST VIRGINIA Watershed 1

**LOCATION:** Hardy County, West Virginia; approximately 5 miles southwest of Moorefield; South Branch Potomac River Basin.

**AREA:** 8.25 acres.

**SHAPE:** Roughly leaf-shaped, major axis 930 ft., minor axis 640 ft.

**SLOPES:** 8% is in 3-10% class; 62% in 10-20%; 30% in 20-30%. Aspect: S

**SOILS:** Residual, derived from gray siltstones with some interbedding of calcareous shales. 1 Litz shaly silt loam 90%; 2 Undifferentiated Alluvium (silty clay loam) 6%; 3 Litz shaly silt loam (moderately deep phase) 3%; 4 Litz silt loam 1%. Topsoil - weak fine granular structure, 1 & 3; strong fine subangular blocky, 2; moderate fine granular structure, 4; av. depth - 4 in., 1; 8 in., 2; 2 in., 3; 3 in., 4. Subsoil - weak fine granular structure, 1; structureless, 2; weak fine subangular blocky, 3; weak to moderate, medium subangular blocky to structureless in lower layer, 4; depth to shale bedrock - 12 in., av., 1; 24 to 36 in., 2; 16 to 26 in., 3; 22 in. av., 4. Permeability of topsoil and subsoil - rapid, 1; variable, 2; moderate to rapid, 3; moderate, 4. Internal drainage - medium, 1 & 4; variable, 2; rapid, 3.

**EROSION:** 1 - 4%; 2 - 3%; 3 - 92%; 4 - 1%.

**LAND CAPABILITY:** II - 4%, III - 4%, IV - 91%, VII - 1%.

**SURFACE DRAINAGE:** Good, length of principle waterway approximately 1000 ft., a natural watershed with surface flow to two well-defined waterways which intersect 30 ft. above the gaging station.

**CHARACTER OF FLOW:** Spring-fed intermittent, continuous.

**INSTRUMENTATION:** Runoff - H-4.5 precalibrated flume. Flume walls and approach walls are of treated T-g, cutoff walls and stilling well concrete. FW-1 recorder. Precipitation - recording gage.

**WATERSHED CONDITIONS:** Pasture, mixed cover, native perennial Lespedeza, Canada and Kentucky Bluegrass, poverty grass, and Buckhorn plantain being the predominant species. Controlled livestock grazing April through November. 800 lbs./acre of 0-20-0 fertilizer applied May 19-22, 1958; 2 tons/acre of lime applied May 22-June 2, 1958. Heavily infested area of bull thistle sprayed with amino-triazole May 20, 1959. Scattered oak sprouts eradicated by annual brush-hogging.

**GENERALLY REPRESENTS:** Pasture practices on shallow shale soil typical of large areas in Eastern West Virginia, Central Pennsylvania, Western Maryland, and parts of Virginia and Tennessee. Applicable to similar lands in the land resource areas of the Southern Appalachian Ridges and Valleys (N-128) and the Northern Appalachian Ridges and Valleys (S-147).

MONTHLY PRECIPITATION AND RUNOFF (Inches)

Moorefield, West Virginia, Watershed 1

| Month    | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year  |
|----------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| 1958 P   |      |      |      | 2.27 | 2.22 | 3.00 | 4.55 | 3.17 | 1.17  | 0.3  | 1.42 | 0.35 | 19.20 |
| Q        |      |      |      |      | 1    | .11  | .05  | .46  | 6     | 0    | 0    | 0    | .62   |
| 1959 P   | 1.59 | 1.47 | 1.58 | 3.3  | 2.77 | 2.80 | 4.2  | 2.15 | 2.54  | 3.27 | .87  | 1.48 | 28.20 |
| Q        | 0    | 0    | 0    | .08  | .04  | .14  | 1    | 6    | 1     | .12  | 0    | .08  | .46   |
| Normal P | 2.33 | 2.33 | 2.31 | 2.33 | 3.43 | 3.78 | 3.33 | 3.12 | 2.48  | 2.24 | 1.78 | 2.03 | 31.87 |

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

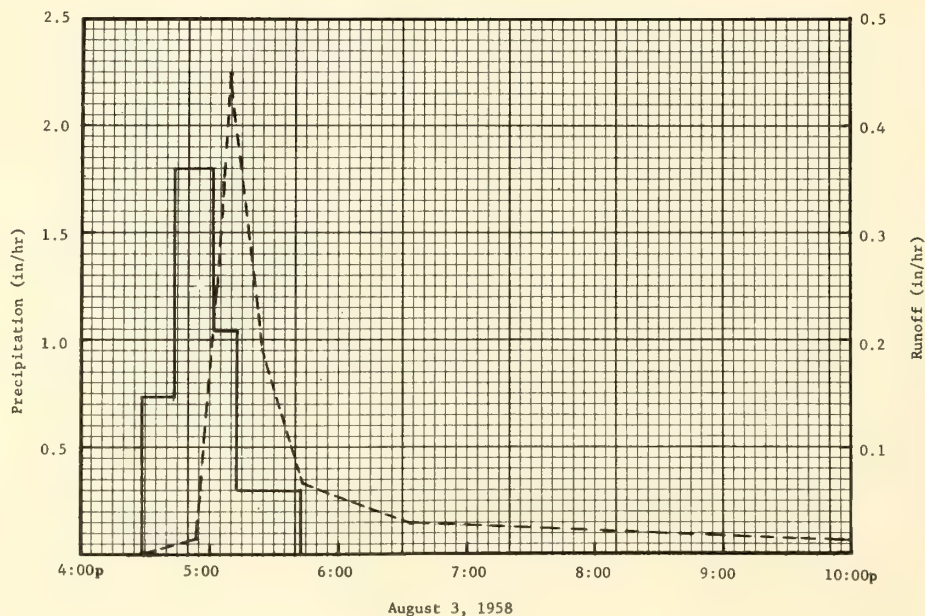
Moorefield, West Virginia Watershed 1

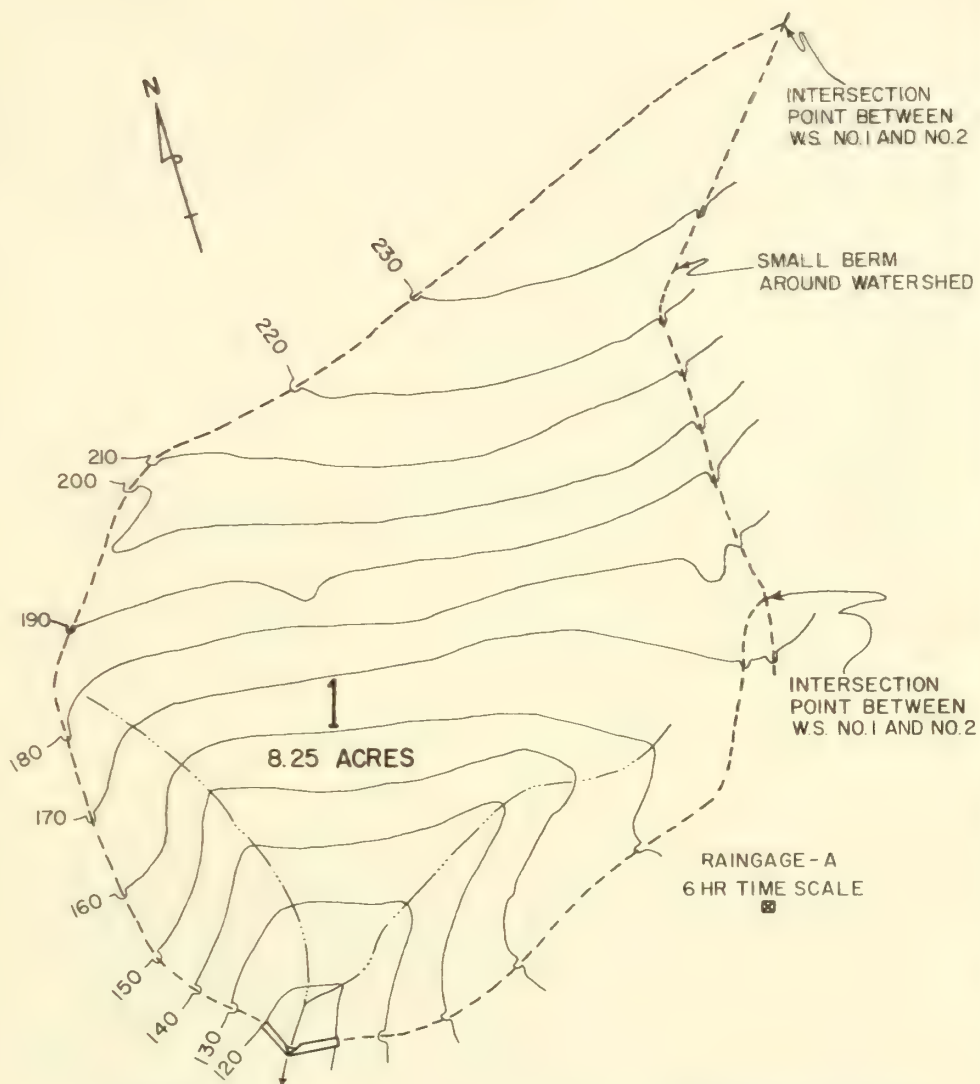
| YEAR              | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |          |      |       |      |        |      |        |      |
|-------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|----------|------|-------|------|--------|------|--------|------|
|                   |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours |      | 1 day |      | 2 days |      | 8 days |      |
|                   | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date     | Vol. | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1958 <sup>1</sup> | 8-3               | 1.44 | 8-3                                       | 0.17 | 8-3     | 0.19 | 8-3     | 0.22 | 8-3      | 0.24 | 8-3   | 0.27 | 8-3    | 0.30 | 8-3    | 0.39 |
| 1959              | 10-24             | 1.3  | 10-24                                     | .02  | 10-24   | .03  | 10-24   | .05  | 10-24    | .08  | 10-24 | .09  | 10-24  | .12  | 10-24  | .14  |

**Notes:** 1/ Station not in complete operation January through May 1958. Quality of records: Monthly P and Q - excellent; annual maximum discharges and volumes - excellent; watershed conditions: 1958, grassland 100%, no grazing; in 1959, grassland 100%; controlled grazing April through November; heavily infested area of thistle sprayed in May 1959. Normal P based on 46-year USWB record Moorefield, West Virginia.

| SELECTED RUNOFF EVENTS                                                           |                   |                 |               |                   |               | Moorefield, West Virginia, Watershed 1 (8.25 Acres) |              |               |
|----------------------------------------------------------------------------------|-------------------|-----------------|---------------|-------------------|---------------|-----------------------------------------------------|--------------|---------------|
| Antecedent conditions                                                            |                   |                 | Rainfall      |                   |               | Runoff                                              |              |               |
| Date                                                                             | Rainfall (inches) | Runoff (inches) | Date and time | Intensity (in/hr) | Acc. (inches) | Date and time                                       | Rate (in/hr) | Acc. (inches) |
| Event of August 3, 1958                                                          |                   |                 |               |                   |               |                                                     |              |               |
| 7-4-58                                                                           | 0.25              | 0               | 8-3-58        | Raingage A        |               | 8-3-58                                              |              |               |
| 7-5                                                                              | .05               | 0               | 4:28p         | 0                 | 0             | 4:29p                                               | 0            | 0             |
| 7-6,7                                                                            | 0                 | 0               | :43           | .72               | .18           | :54                                                 | .0069        | T             |
| 7-8                                                                              | .02               | 0               | 5:02          | 1.80              | .75           | 5:03                                                | .2472        | .02           |
| 7-9                                                                              | .03               | 0               | :13           | 1.04              | .94           | :06                                                 | .3426        | .03           |
| 7-10,11                                                                          | 0                 | 0               | :43           | .30               | 1.09          | :10                                                 | .4436        | .06           |
| 7-12                                                                             | .20               | 0               |               |                   |               | :24                                                 | .1948        | .13           |
| 7-13,17                                                                          | 0                 | 0               |               |                   |               | :43                                                 | .0684        | .18           |
| 7-18                                                                             | .50               | T               |               |                   |               | 6:34                                                | .0142        | .21           |
| 7-19,20                                                                          | 0                 | 0               |               |                   |               | 9:54                                                | .0069        | .25           |
| 7-21                                                                             | .68               | T               |               |                   |               |                                                     |              |               |
| 7-22                                                                             | 1.49              | .03             |               |                   |               | 12:00n <sup>1/</sup>                                | .0018        | .30           |
| 7-23                                                                             | .50               | T               |               |                   |               |                                                     |              |               |
| 7-24                                                                             | .25               | T               |               |                   |               |                                                     |              |               |
| 7-25                                                                             | 0                 | 0               |               |                   |               |                                                     |              |               |
| 7-26                                                                             | .45               | T               |               |                   |               |                                                     |              |               |
| 7-27                                                                             | .08               | .01             |               |                   |               |                                                     |              |               |
| 7-28                                                                             | .20               | T               |               |                   |               |                                                     |              |               |
| 7-29                                                                             | 0                 | T               |               |                   |               |                                                     |              |               |
| 7-30                                                                             | 0                 | 0               |               |                   |               |                                                     |              |               |
| 7-31                                                                             | .10               | 0               |               |                   |               |                                                     |              |               |
| 8-1                                                                              | .25               | T               |               |                   |               |                                                     |              |               |
| 8-2                                                                              | 0                 | 0               |               |                   |               |                                                     |              |               |
| 8-3 to 4:28p                                                                     | .21               | 0               |               |                   |               |                                                     |              |               |
| Watershed Conditions:<br>Mixed grass cover; 70-75% of area covered by vegetation |                   |                 |               |                   |               |                                                     |              |               |

Notes: To convert runoff in in./hr. to cfs, multiply by 8.3188. <sup>1/</sup> Runoff continued at a rate less than .001 in./hr. until runoff ends at 11:00p 8-14-58.





- Legend**
- 4.5' H-TYPE FLUME
  - WATERSHED BOUNDARY
  - RECORDING RAINGAGE
  - 10' CONTOURS
  - WATERWAY (INTERMITTENT FLOW)

MOOREFIELD, WEST VIRGINIA  
WATERSHED NO. 1



MOOREFIELD, WEST VIRGINIA Watershed 2

LOCATION: Hardy County, West Virginia; approximately 5 miles southwest of Moorefield; South Branch Potomac River Basin.

AREA: 10.06 acres.

SHAPE: Rectangular - 900 ft. long by 530 ft. wide.

SLOPES: 17% - 3-10% class; 62% - 10-20% class; 20% - 20-30% class; 1% - 30-40% class. Aspect - S

SOILS: Residual, derived from gray siltstones with some interbedding of calcareous shales. 1 Litz shaly silt loam 83%; 2 Undifferentiated Alluvium (silty clay loam) 8%; 3 Clarksburg silt loam 7%; 4 Litz silt loam (moderately well drained phase) 2%. Topsoil - weak fine granular structure, 1 & 4; strong fine subangular blocky, 2; weak medium granular structure, 3; av. depth - 4 in., 1 & 4; 8 in., 2; 6 in., 3. Subsoil - weak fine granular structure, 1; structureless, 2; moderate fine subangular blocky to strong fine blocky to massive structure in lower layers, 3; moderate, fine to medium, subangular blocky to massive structure in lower layer, 4; depth to shale bed-rock - 12 in. av., 1; 24 to 36 in., 2; 64 in. av., 3; 17 in. av., 4. Permeability of topsoil & subsoil - rapid, 1; variable, 2; slow, 3; moderate to slow, 4. Internal drainage - medium, 1 & 3; variable, 2; slow, 4.

EROSION: 1 - 8%; 3 - 89%; 4 - 3%.

LAND CAPABILITY: II - 6%; III - 15%; IV - 77%; VII - 2%.

SURFACE DRAINAGE: Good, length of principle waterway 1000 ft., a natural watershed with surface flow into a well-defined waterway.

CHARACTER OF FLOW: Spring-fed intermittent, continuous.

INSTRUMENTATION: Runoff - H-4.5 precalibrated flume. Flume walls and approach walls are of treated T-g, cutoff walls and stilling well concrete. Heating elements in flume floor and stilling well. FW-1 recorder. Precipitation - recording gage.

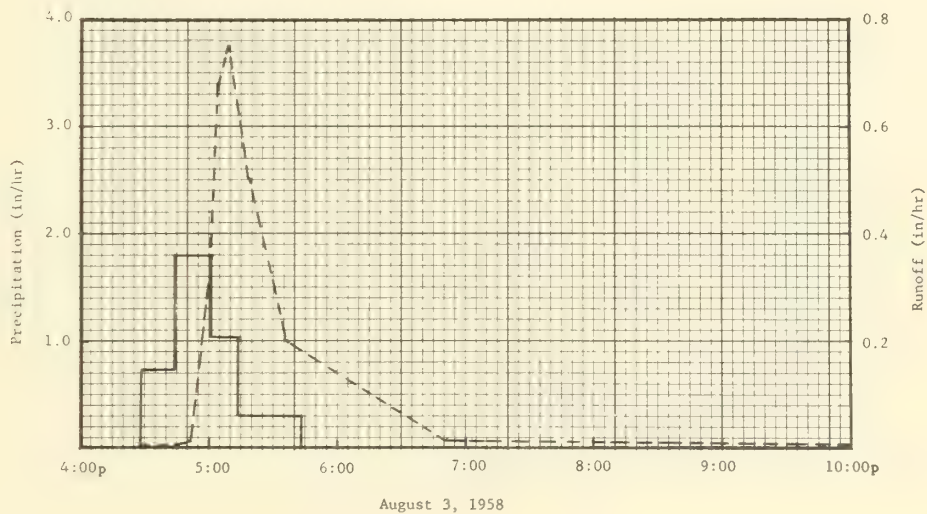
WATERSHED CONDITIONS: Pasture, mixed cover, Buckhorn plantain, Kentucky Bluegrass, Canada Bluegrass, cheat, poverty grass and sheep sorrel principle species. 800 lbs./acre of 0-20-0 fertilizer applied May 19-22, 1958; 2 tons/acre of lime applied May 22 - June 2, 1958. Controlled, annual grazing by livestock April through November. Scattered oak sprouts eradicated by annual brush-hogging.

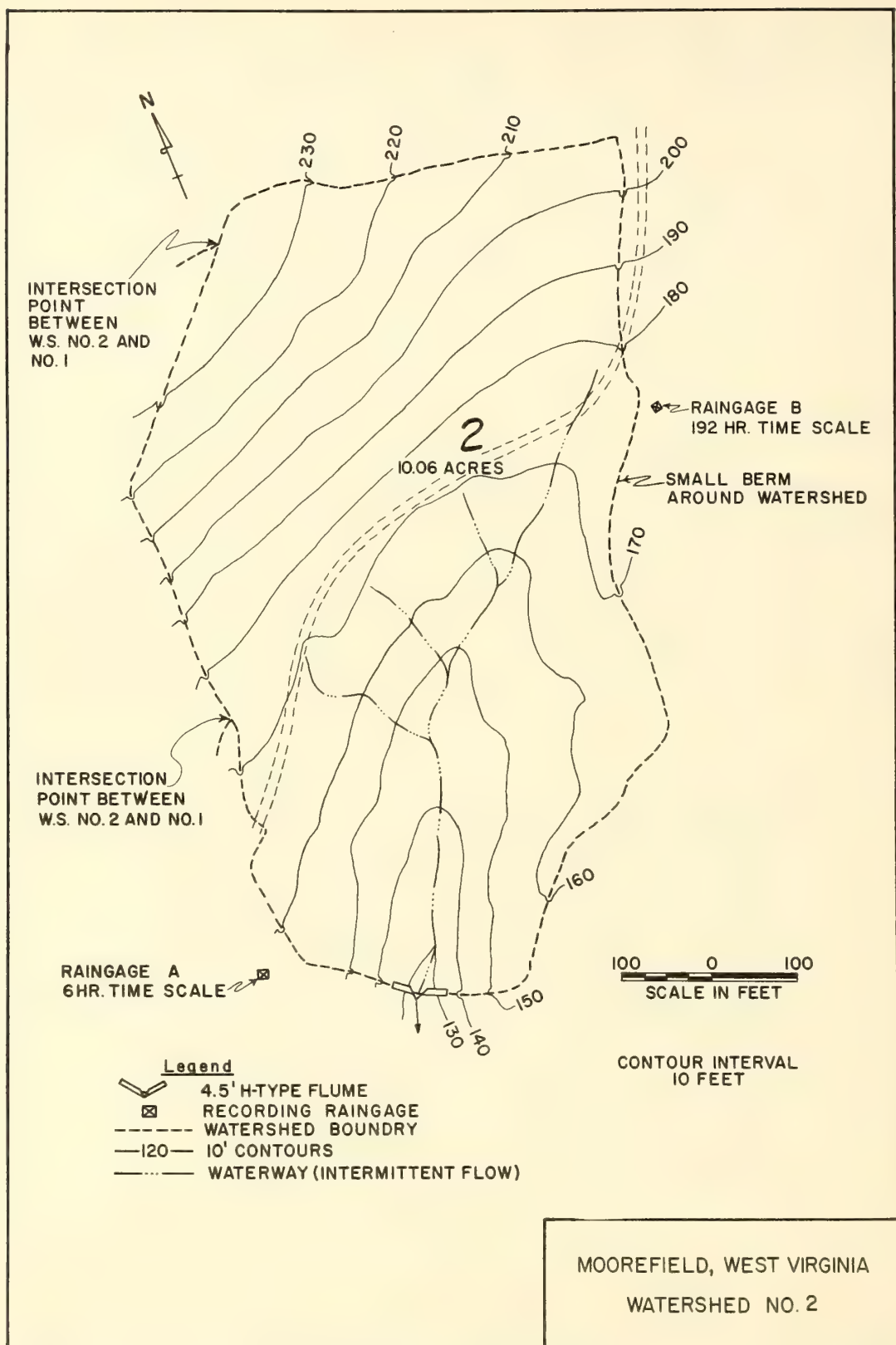
GENERALLY REPRESENTS: Pasture practices on shallow shale soil typical of large areas in Eastern West Virginia, Central Pennsylvania, Western Maryland and parts of Virginia and Tennessee. Applicable to similar lands in the land resource areas of Southern Appalachian Ridges and Valleys (N-128) and Northern Appalachian Ridges and Valleys (S-147).

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                                                                                                                                                                                                                                              |                   |      |                                           |      |         |      |         | Moorefield, West Virginia, Watershed 2 |          |      |       |      |        |      |        |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|----------------------------------------|----------|------|-------|------|--------|------|--------|------|
| Month<br>Year                                                                                                                                                                                                                                                                                                                                                                                          | Jan.              | Feb. | Mar.                                      | Apr. | May     | June | July    | Aug.                                   | Sept.    | Oct. | Nov.  | Dec. | Year   |      |        |      |
| 1958 P                                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |                                           | 2.67 | 2.22    | 3.00 | 4.55    | 3.17                                   | 1.17     | 0.65 | 1.42  | 0.35 | 19.20  |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                                                                                                      |                   |      |                                           |      | 1/      | .05  | .22     | .54                                    | 0        | 0    | 0     | 0    | .81    |      |        |      |
| 1959 P                                                                                                                                                                                                                                                                                                                                                                                                 | 1.59              | 0.49 | 1.58                                      | 3.34 | 2.77    | 2.80 | 4.82    | 2.15                                   | 2.54     | 3.27 | .87   | 1.98 | 28.20  |      |        |      |
| Q                                                                                                                                                                                                                                                                                                                                                                                                      | 0                 | 0    | T                                         | .24  | .16     | .36  | .05     | T                                      | .03      | .29  | T     | .26  | 1.39   |      |        |      |
| Normal P                                                                                                                                                                                                                                                                                                                                                                                               | 2.30              | 2.03 | 2.61                                      | 2.73 | 3.95    | 3.78 | 3.33    | 3.12                                   | 2.48     | 2.23 | 1.78  | 2.03 | 31.87  |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                                                                                                                                                                                                                                                |                   |      |                                           |      |         |      |         | Moorefield, West Virginia Watershed 2  |          |      |       |      |        |      |        |      |
| YBAR                                                                                                                                                                                                                                                                                                                                                                                                   | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |                                        |          |      |       |      |        |      |        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                        |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |                                        | 12 hours |      | 1 day |      | 2 days |      | 8 days |      |
|                                                                                                                                                                                                                                                                                                                                                                                                        | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol.                                   | Date     | Vol. | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1958 <sup>1/</sup>                                                                                                                                                                                                                                                                                                                                                                                     | 8-3               | 0.76 | 8-3                                       | 0.34 | 8-3     | 0.38 | 8-3     | 0.42                                   | 8-3      | 0.44 | 8-3   | 0.45 | 8-3    | 0.47 | 8-1    | 0.53 |
| 1959                                                                                                                                                                                                                                                                                                                                                                                                   | 4-28              | .18  | 4-28                                      | .10  | 4-28    | .13  | 4-28    | .17                                    | 4-28     | .20  | 6-1   | .31  | 6-1    | .36  | 6-1    | .36  |
| Notes: <sup>1/</sup> Station not in complete operation January through May 1958. Quality of records: Monthly P and Q - excellent; annual maximum discharges and volumes - excellent; watershed conditions: in 1958, 100% grassland with no grazing; in 1959, 100% grassland with controlled livestock grazing April through November. Normal P based on 46-year USWB record Moorefield, West Virginia. |                   |      |                                           |      |         |      |         |                                        |          |      |       |      |        |      |        |      |

| SELECTED RUNOFF EVENTS  |                      |                    | Moorefield, West Virginia, Watershed 2 (10.06 acres)                                 |                      |                  |                      |                 |                  |
|-------------------------|----------------------|--------------------|--------------------------------------------------------------------------------------|----------------------|------------------|----------------------|-----------------|------------------|
| Antecedent conditions   |                      |                    | Rainfall                                                                             |                      |                  | Runoff               |                 |                  |
| Date                    | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                                                                     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time     | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 3, 1958 |                      |                    |                                                                                      |                      |                  |                      |                 |                  |
| 7-4-58                  | 0.25                 | 0                  | 8-3-58                                                                               | Raingage A           |                  | 8-3-58               |                 |                  |
| 7-5                     | .05                  | 0                  | 4:28p                                                                                | 0                    | 0                | 4:28p                | 0.0006          | 0                |
| 7-6,7                   | 0                    | 0                  | :43                                                                                  | .72                  | .18              | :46                  | .0066           | .001             |
| 7-8                     | .02                  | 0                  | 5:02                                                                                 | 1.80                 | .75              | :51                  | .0180           | .002             |
| 7-9                     | .03                  | 0                  | :13                                                                                  | 1.04                 | .94              | 5:01                 | .3499           | .033             |
| 7-10,11                 | 0                    | 0                  | :43                                                                                  | .30                  | 1.09             | :04                  | .6672           | .058             |
| 7-12                    | .20                  | 0                  |                                                                                      |                      |                  | :08                  | .7682           | .106             |
| 7-13,17                 | 0                    | 0                  |                                                                                      |                      |                  | :18                  | .4988           | .211             |
| 7-18                    | .50                  | 0                  |                                                                                      |                      |                  | :36                  | .2010           | .316             |
| 7-19,20                 | 0                    | 0                  |                                                                                      |                      |                  | :56                  | .0833           | .363             |
| 7-21                    | .68                  | T                  |                                                                                      |                      |                  | 6:52                 | .0180           | .411             |
| 7-22                    | 1.49                 | .140               |                                                                                      |                      |                  | 12:00m               | .0040           | .467             |
| 7-23                    | .50                  | .027               |                                                                                      |                      |                  | 8-4-58               |                 |                  |
| 7-24                    | .25                  | .016               |                                                                                      |                      |                  | 12:00m <sup>1/</sup> | .0006           | .522             |
| 7-25                    | 0                    | T                  |                                                                                      |                      |                  |                      |                 |                  |
| 7-26                    | .45                  | .024               |                                                                                      |                      |                  |                      |                 |                  |
| 7-27                    | .08                  | .002               |                                                                                      |                      |                  |                      |                 |                  |
| 7-28                    | .20                  | T                  |                                                                                      |                      |                  |                      |                 |                  |
| 7-29,30                 | 0                    | 0                  |                                                                                      |                      |                  |                      |                 |                  |
| 7-31                    | .10                  | .007               |                                                                                      |                      |                  |                      |                 |                  |
| 8-1                     | .25                  | .014               | Watershed conditions: Mixed<br>grass cover; 60-70% of area<br>covered by vegetation. |                      |                  |                      |                 |                  |
| 8-2                     | 0                    | .011               |                                                                                      |                      |                  |                      |                 |                  |
| 8-3 to<br>4:28p         | .21                  | .007               |                                                                                      |                      |                  |                      |                 |                  |

Notes: To convert runoff in in./hr. to cfs, multiply by 10.1437. <sup>1/</sup> Runoff continued at a rate less than .0006 in./hr. until runoff ended 12:25 a 8-7-58.





## MOOREFIELD, WEST VIRGINIA Watershed 4

**LOCATION:** Hardy County, West Virginia; approximately 5 miles southwest of Moorefield; South Branch Potomac River Basin.

**AREA:** 6.32 acres

**SHAPE:** Rectangular - 600 ft. long by 450 ft. wide.

**SLOPES:** 26% - 3-10% class; 74% - 10-20% class; Aspect - SE

**SOILS:** Residual, derived from gray siltstones with some interbedding of calcareous shales. 1 Litz shaly silt loam 79%; 2 Litz silt loam 14%; 3 Litz silt loam (moderately well drained phase) 7%. Topsoil - weak fine granular structure, 1 & 3; moderate fine granular structure, 2; av. depth - 4 in., 1 & 3; 3 in., 2. Subsoil - weak fine granular structure, 1; weak to moderate, medium subangular blocky to structureless in lower layer, 2; moderate, fine to medium, subangular blocky to massive structure in lower layer, 3; depth to shale bedrock - 12 in. av., 1; 22 in. av., 2; 17 in. av., 3. Permeability of topsoil and subsoil - rapid, 1; moderate, 2; moderate to slow, 3. Internal drainage - medium, 1 & 2; slow, 3.

**EROSION:** 2 - 1%; 3 - 99%.

**LAND CAPABILITY:** II - 7%; III - 30%; IV - 63%.

**SURFACE DRAINAGE:** Good, length of principle waterway 760 ft., a 290-ft. diversion used to bring runoff from west slope through gaging station. Remainder of watershed drains into a well-defined waterway.

**CHARACTER OF FLOW:** Spring-fed intermittent, continuous.

**INSTRUMENTATION:** Runoff - H-4.5 precalibrated flume. Flume walls and approach walls are of treated T-G; cutoff walls and stilling well concrete. Heating elements in flume floor and stilling well. FW-1 recorder. Precipitation - recording gage.

**WATERSHED CONDITIONS:** Pasture, mixed cover, Kentucky Bluegrass, cinquefoil, poverty grass, Buckhorn plantain, and native perennial lespedeza the major species. 800 lbs./acre of 0-20-0 fertilizer applied May 19-22, 1958; 2 tons/acre of lime applied May 22 - June 2, 1958. Controlled annual grazing by livestock April through November. Scattered oak sprouts eradicated by annual brush-hogging.

**GENERALLY REPRESENTS:** Pasture practices on shallow shale soil typical of large areas in Eastern West Virginia, Central Pennsylvania, Western Maryland and parts of Virginia and Tennessee. Applicable to similar lands in the land resource areas of the Southern Appalachian Ridges and Valleys (N-128) and the Northern Appalachian Ridges and Valleys (S-147).

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

Moorefield, West Virginia Watershed 4

| Year                             | Month | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year  |
|----------------------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| 1958 <sup>1</sup> / <sub>P</sub> |       |      |      |      |      |      | 2.98 | 4.31 | 3.19 | 1.09  | 0.62 | 1.36 | 0.33 | 13.88 |
|                                  | Q     |      |      |      |      |      | .07  | .25  | .61  | 0     | 0    | .01  | 0    | .94   |
| 1959                             | P     | 1.60 | 0.49 | 1.65 | 3.32 | 2.90 | 2.95 | 4.85 | 2.25 | 2.46  | 3.23 | .91  | 2.01 | 28.62 |
|                                  | Q     | .01  | 0    | T    | .09  | .04  | .16  | .15  | .02  | .08   | .21  | .01  | .11  | .88   |
| Normal                           | P     | 2.30 | 2.03 | 2.61 | 2.73 | 3.45 | 3.78 | 3.33 | 3.12 | 2.48  | 2.23 | 1.78 | 2.03 | 31.87 |

## ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Moorefield, West Virginia Watershed 4

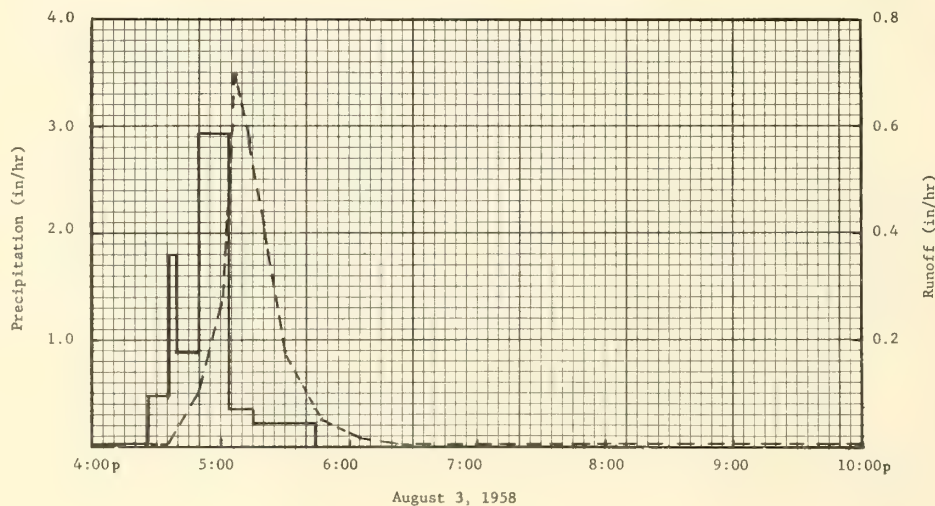
| YEAR                             | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |          |      |       |      |        |      |        |      |
|----------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|----------|------|-------|------|--------|------|--------|------|
|                                  |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours |      | 1 day |      | 2 days |      | 8 days |      |
|                                  | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date     | Vol. | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1958 <sup>1</sup> / <sub>P</sub> | 8-3               | 0.68 | 8-3                                       | 0.27 | 8-3     | 0.28 | 8-3     | 0.30 | 8-3      | 0.32 | 8-3   | 0.35 | 8-3    | 0.36 | 8-3    | 0.55 |
| 1959                             | 7-26              | .48  | 10-23                                     | .07  | 10-23   | .08  | 10-23   | .12  | 10-23    | .17  | 10-23 | .20  | 10-23  | .20  | 10-23  | .21  |

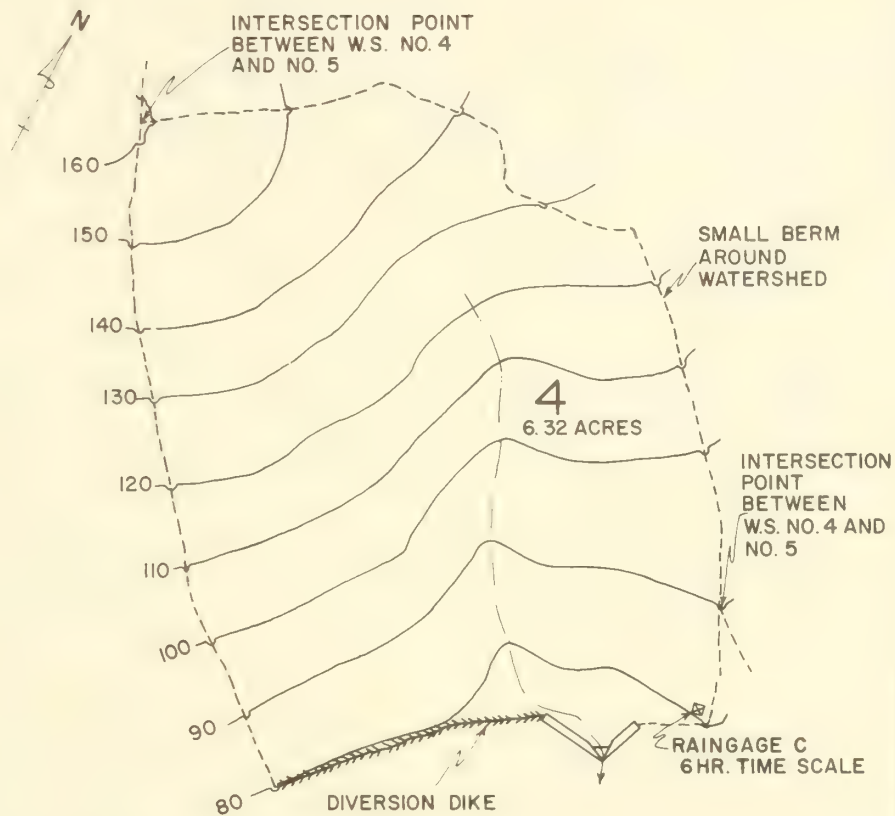
**Notes:** 1/ Station not in complete operation January through May 1958. Quality of records: Monthly P and Q excellent; annual maximum discharges and volumes, excellent; watershed conditions: in 1958, 100% grassland with no grazing; in 1959, 100% grassland with controlled livestock grazing April through November. Normal P based on 46-year USWB record, Moorefield, West Virginia



| SELECTED RUNOFF EVENTS  |                      |                    |                                                                                      |                      |                  | Moorefield, West Virginia Watershed 4 (6.32 acres) |                 |                  |
|-------------------------|----------------------|--------------------|--------------------------------------------------------------------------------------|----------------------|------------------|----------------------------------------------------|-----------------|------------------|
| Antecedent conditions   |                      |                    | Rainfall                                                                             |                      |                  | Runoff                                             |                 |                  |
| Date                    | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                                                                     | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                                   | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 3, 1958 |                      |                    |                                                                                      |                      |                  |                                                    |                 |                  |
| 7-4-58                  | 0.25                 | 0                  | 8-3-58                                                                               | Raingage C           |                  | 8-3-58                                             |                 |                  |
| 7-5                     | .05                  | 0                  | 4:00p                                                                                | 0                    | 0                | 4:00p                                              | 0.0001          | 0                |
| 7-6,7                   | 0                    | 0                  | :27                                                                                  | .02                  | .01              | :48                                                | .0488           | .02              |
| 7-8                     | .02                  | 0                  | :36                                                                                  | .47                  | .08              | 5:00                                               | .2337           | .05              |
| 7-9                     | .03                  | 0                  | :39                                                                                  | 1.80                 | .17              | :07                                                | .6935           | .10              |
| 7-10,11                 | 0                    | 0                  | :50                                                                                  | .87                  | .33              | :14                                                | .5789           | .18              |
| 7-12                    | .20                  | 0                  | 5:03                                                                                 | 2.91                 | .96              | :30                                                | .1742           | .28              |
| 7-13,17                 | 0                    | 0                  | :15                                                                                  | .35                  | 1.03             | :47                                                | .0488           | .31              |
| 7-18                    | .50                  | T                  | :43                                                                                  | .21                  | 1.13             | 6:05                                               | .0151           | .32              |
| 7-19,20                 | 0                    | 0                  |                                                                                      |                      |                  | :22                                                | .0078           | .32              |
| 7-21                    | .66                  | .01                |                                                                                      |                      |                  | 12:00m                                             | .0033           | .35              |
| 7-22                    | 1.29                 | .11                |                                                                                      |                      |                  | 8-4-58                                             |                 |                  |
| 7-23                    | .22                  | .01                |                                                                                      |                      |                  | 12:00m <sup>1/</sup>                               | .0016           | .41              |
| 7-24                    | .28                  | .01                |                                                                                      |                      |                  |                                                    |                 |                  |
| 7-25                    | 0                    | 0                  |                                                                                      |                      |                  |                                                    |                 |                  |
| 7-26                    | .44                  | .04                |                                                                                      |                      |                  |                                                    |                 |                  |
| 7-27                    | .11                  | .02                |                                                                                      |                      |                  |                                                    |                 |                  |
| 7-28                    | .14                  | .01                |                                                                                      |                      |                  |                                                    |                 |                  |
| 7-29                    | 0                    | .01                |                                                                                      |                      |                  |                                                    |                 |                  |
| 7-30                    | 0                    | 0                  |                                                                                      |                      |                  |                                                    |                 |                  |
| 7-31                    | .12                  | 0                  | Watershed conditions: Mixed<br>grass cover; 40-65% of area<br>covered by vegetation. |                      |                  |                                                    |                 |                  |
| 8-1                     | .27                  | .01                |                                                                                      |                      |                  |                                                    |                 |                  |
| 8-2                     | 0                    | 0                  |                                                                                      |                      |                  |                                                    |                 |                  |
| 8-3 to<br>4:00p         | .16                  | T                  |                                                                                      |                      |                  |                                                    |                 |                  |

Notes: To convert runoff in in./hr. to cfs, multiply by 6.3728. <sup>1/</sup> Runoff continued at rates less than .001 in./hr. until runoff ends 3:59p, 8-7-58.





- Legend**
- 4.5' H-TYPE FLUME
  - WATERSHED BOUNDARY
  - RECORDING RAINGAGE
  - 120' 10' CONTOURS
  - WATERWAY (INTERMITTENT FLOW)

100 0 100  
SCALE IN FEET

CONTOUR INTERVAL  
10 FEET

MOOREFIELD, WEST VIRGINIA  
WATERSHED NO. 4

## MOOREFIELD, WEST VIRGINIA Watershed 5

**LOCATION:** Hardy County, West Virginia; approximately 5 miles southwest of Moorefield; South Branch Potomac River Basin.

**AREA:** 9.55 acres

**SHAPE:** Roughly isosceles triangle, base 1040', alt. 600 ft.

**SLOPES:** 63% - 3-10% class; 31% - 10-20% class; 5% - 20-30% class; 1% - 30-40% class

**SOILS:** Residual, derived from gray siltstones with some interbedding of calcareous shales. 1 Litz shaly silt loam 75%; 2 Litz silt loam (moderately well drained phase) 10%; 3 Litz shaly silt loam (moderately deep phase) 8%; 4 Clarksburg silt loam 7%. Topsoil - weak fine granular structure, 1, 2, & 3; weak medium granular structure, 4. Subsoil - weak fine granular structure, 1; moderate, fine to medium, subangular blocky to massive structure in lower layer, 2; weak fine subangular blocky, 3; moderate fine subangular blocky to strong fine blocky to massive structure in lower layers, 4; depth to shale bedrock - 12 in. av., 1; 17 in. av., 2; 16 to 24 in., 3; 64 in. av., 4. Permeability of topsoil & subsoil - rapid, 1; moderate to slow, 2; moderate to rapid, 3; slow, 4. Internal drainage - medium, 1 & 4; slow, 2; rapid, 3.

**EROSION:** 2 - 14%; 3 - 85%; 4 - 1%.

**LAND CAPABILITY:** II - 9%; III - 45%; IV - 45%; VII - 1%.

**SURFACE DRAINAGE:** Good, length of principle waterway 900 feet. A natural watershed with surface flow to a number of subsidiary waterways which drain into a common well-defined waterway.

**CHARACTER OF FLOW:** Spring-fed intermittent, continuous.

**INSTRUMENTATION:** Runoff - H-4.5 precalibrated flume. Flume walls and approach walls are of treated T-G, cutoff walls and stilling well concrete. Heating elements in flume floor and stilling well. FW-1 recorder. Precipitation - recording gage.

**WATERSHED CONDITIONS:** Pasture, mixed cover, Kentucky Bluegrass, Canada Bluegrass, Blackhorn plantain, poverty grass and cinquefoil the predominant species; 800 lbs./acre of 0-20-0 fertilizer applied May 19-22, 1958; 2 tons/acre of lime applied May 22-June 2, 1958. Controlled annual grazing by livestock April through November. Scattered oak sprouts eradicated by annual brush-hogging.

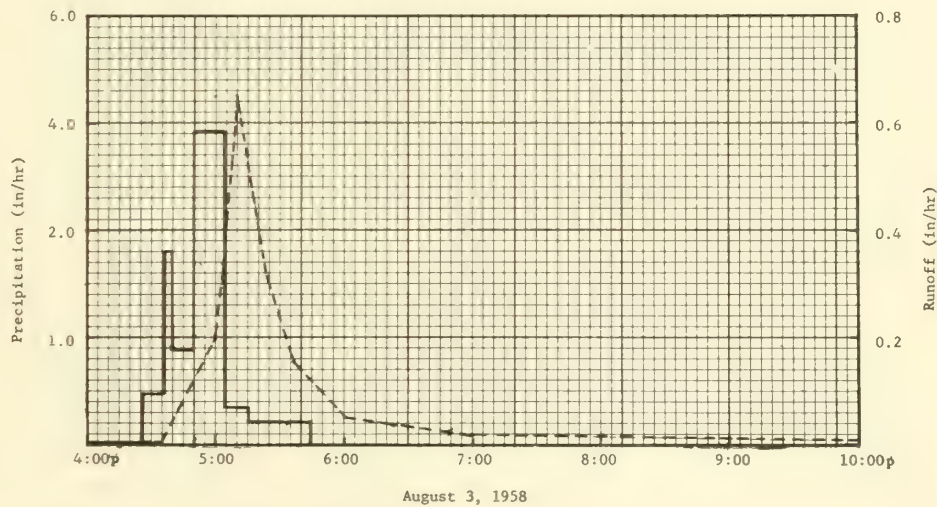
**GENERALLY REPRESENTS:** Pasture practices on shallow shale soil typical of large areas in Eastern West Virginia, Central Pennsylvania, Western Maryland, and parts of Virginia and Tennessee. Applicable to similar lands in the land resource areas of the Southern Appalachian Ridges and Valleys (N-128) and the Northern Appalachian Ridges and Valleys (S-147).

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                               |                   |      |                                           |      |         |      |         |      | Moorefield, West Virginia Watershed 5 |       |       |      |        |       |        |      |
|-------------------------------------------------------------------------------------------------------------------------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|---------------------------------------|-------|-------|------|--------|-------|--------|------|
| Year                                                                                                                    | Month             | Jan. | Feb.                                      | Mar. | Apr.    | May  | June    | July | Aug.                                  | Sept. | Oct.  | Nov. | Dec.   | Year  |        |      |
| 1958 <sup>1/</sup>                                                                                                      | P                 |      |                                           |      |         |      | 2.98    | 4.31 | 3.19                                  | 1.09  | 0.62  | 1.36 | 0.33   | 13.88 |        |      |
|                                                                                                                         | Q                 |      |                                           |      |         |      | .03     | .15  | .51                                   | 0     | 0     | 0    | 0      | .69   |        |      |
| 1959                                                                                                                    | P                 | 1.60 | 0.49                                      | 1.65 | 3.32    | 2.90 | 2.95    | 4.85 | 2.25                                  | 2.46  | 3.23  | .91  | 2.01   | 28.62 |        |      |
|                                                                                                                         | Q                 | 0    | 0                                         | T    | .26     | .13  | .32     | .05  | T                                     | T     | .34   | T    | .27    | 1.37  |        |      |
| Normal                                                                                                                  | P                 | 2.30 | 2.03                                      | 2.61 | 2.73    | 3.95 | 3.78    | 3.33 | 3.12                                  | 2.48  | 2.23  | 1.78 | 2.03   | 31.87 |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS |                   |      |                                           |      |         |      |         |      | Moorefield, West Virginia Watershed 5 |       |       |      |        |       |        |      |
| YEAR                                                                                                                    | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |                                       |       |       |      |        |       |        |      |
|                                                                                                                         |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours                              |       | 1 day |      | 2 days |       | 8 days |      |
|                                                                                                                         | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date                                  | Vol.  | Date  | Vol. | Date   | Vol.  | Date   | Vol. |
| 1958 <sup>1/</sup>                                                                                                      | 8-3               | 0.65 | 8-3                                       | 0.27 | 8-3     | 0.31 | 8-3     | 0.37 | 8-3                                   | 0.42  | 8-3   | 0.46 | 8-3    | 0.46  | 8-3    | 0.50 |
| 1959                                                                                                                    | 7-26              | .14  | 4-28                                      | .05  | 4-28    | .07  | 10-24   | .15  | 10-24                                 | .20   | 10-24 | .26  | 6-1    | .30   | 10-23  | .34  |

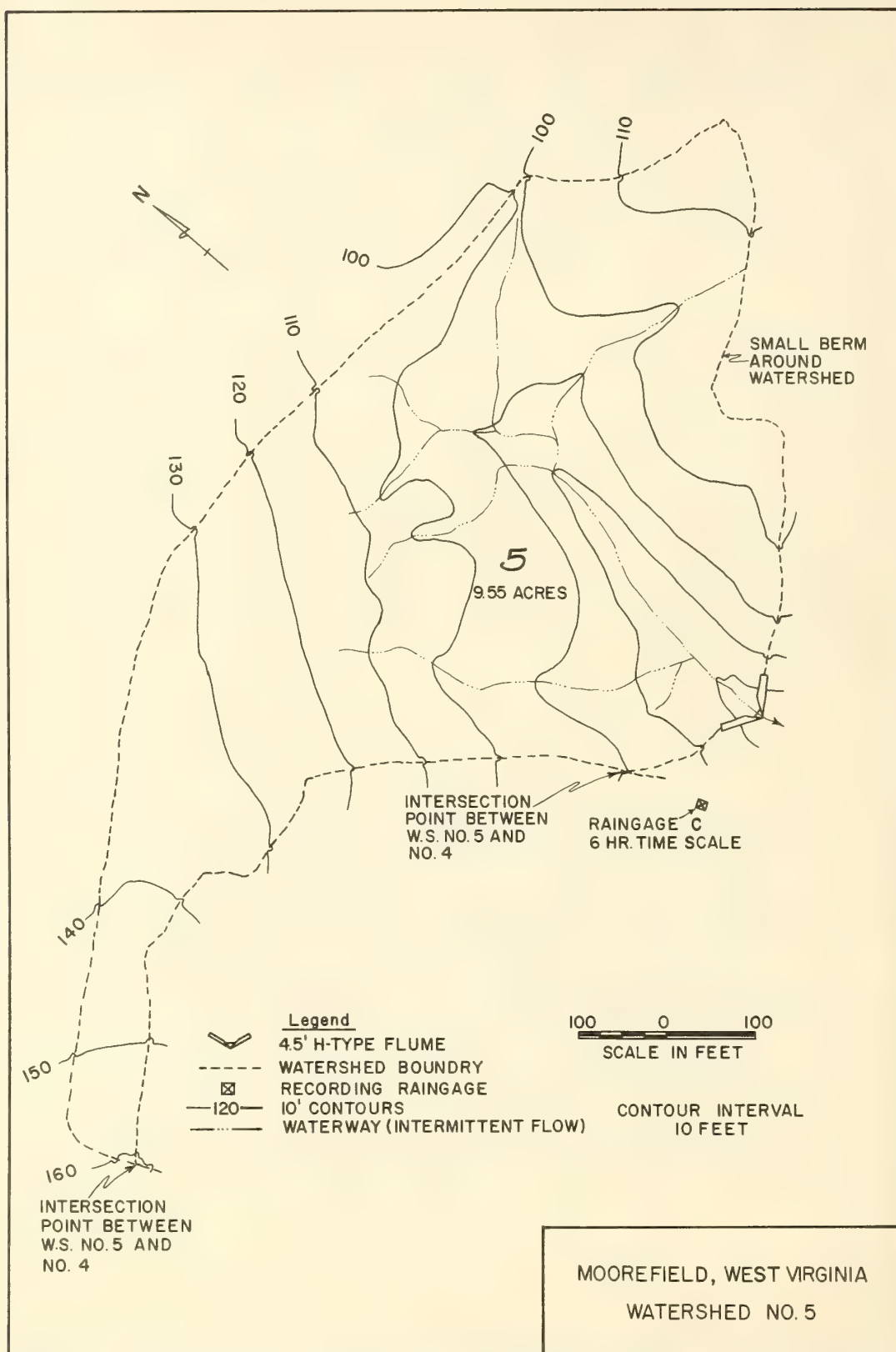
**Notes:** <sup>1/</sup> Station not in complete operation January through May 1958. Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Watershed conditions: in 1958, 100% grassland with no grazing; in 1959, 100% grassland with controlled livestock grazing April through November. Normal P based on 46-year USWB record, Moorefield, West Virginia.

| SELECTED RUNOFF EVENTS  |                      |                    |                                                                                       | Moorefield, West Virginia Watershed 5 (9.55 acres) |                  |                      |                 |                  |
|-------------------------|----------------------|--------------------|---------------------------------------------------------------------------------------|----------------------------------------------------|------------------|----------------------|-----------------|------------------|
| Antecedent conditions   |                      |                    | Rainfall                                                                              |                                                    |                  | Runoff               |                 |                  |
| Date                    | Rainfall<br>(inches) | Runoff<br>(inches) | Date and<br>time                                                                      | Intensity<br>(in/hr)                               | Acc.<br>(inches) | Date and<br>time     | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of August 3, 1958 |                      |                    |                                                                                       |                                                    |                  |                      |                 |                  |
| 7-4-58                  | 0.25                 | 0                  | 8-3-58                                                                                | Raingage C                                         |                  | 8-3-58               |                 |                  |
| 7-5                     | .05                  | 0                  | 4:00p                                                                                 | 0                                                  | 0                | 4:00p                | 0.0001          | 0                |
| 7-6,7                   | 0                    | 0                  | :27                                                                                   | .02                                                | .01              | :37                  | .0007           | T                |
| 7-8                     | .02                  | 0                  | :36                                                                                   | .47                                                | .08              | 5:00                 | .2009           | .04              |
| 7-9                     | .03                  | 0                  | :39                                                                                   | 1.80                                               | .17              | :03                  | .3820           | .05              |
| 7-10,11                 | 0                    | 0                  | :50                                                                                   | .87                                                | .33              | :09                  | .6513           | .11              |
| 7-12                    | .20                  | 0                  | 5:03                                                                                  | 2.91                                               | .96              | :14                  | .5404           | .15              |
| 7-13,17                 | 0                    | 0                  | :15                                                                                   | .35                                                | 1.03             | :23                  | .3147           | .22              |
| 7-18                    | .50                  | 0                  | :43                                                                                   | .21                                                | 1.13             | :36                  | .1543           | .27              |
| 7-19,20                 | 0                    | 0                  |                                                                                       |                                                    |                  | 6:00                 | .0539           | .31              |
| 7-21                    | .66                  | T                  |                                                                                       |                                                    |                  | 7:00                 | .0188           | .35              |
| 7-22                    | 1.29                 | .08                |                                                                                       |                                                    |                  | 10:00                | .0110           | .39              |
| 7-23                    | .22                  | .01                |                                                                                       |                                                    |                  | 8-4-58               |                 |                  |
| 7-24                    | .28                  | .01                |                                                                                       |                                                    |                  | 12:00m <sup>1/</sup> | .0007           | .54              |
| 7-25                    | 0                    | T                  |                                                                                       |                                                    |                  |                      |                 |                  |
| 7-26                    | .44                  | .04                |                                                                                       |                                                    |                  |                      |                 |                  |
| 7-27                    | .11                  | .01                |                                                                                       |                                                    |                  |                      |                 |                  |
| 7-28                    | .14                  | T                  |                                                                                       |                                                    |                  |                      |                 |                  |
| 7-29                    | 0                    | T                  |                                                                                       |                                                    |                  |                      |                 |                  |
| 7-30                    | 0                    | 0                  |                                                                                       |                                                    |                  |                      |                 |                  |
| 7-3                     | .12                  | T                  | Watershed conditions: Mixed<br>grass cover; 50-65% of area<br>covered with vegetation |                                                    |                  |                      |                 |                  |
| 8-1                     | .27                  | .01                |                                                                                       |                                                    |                  |                      |                 |                  |
| 8-2                     | 0                    | T                  |                                                                                       |                                                    |                  |                      |                 |                  |
| 8-3 to<br>4:00p         | .16                  | T                  |                                                                                       |                                                    |                  |                      |                 |                  |

Notes: To convert runoff in in./hr. to cfs, multiply by 9.6296. <sup>1/</sup> Runoff continued at a rate less than .0008 until next event 2:16 a, 8-8-58.







## NORTH DANVILLE, VERMONT Watershed W-1

**LOCATION:** Caledonia Co., Vt., 5 mi. NW of St. Johnsbury; Sleepers River, Connecticut River Basin.

**AREA:** 10,610 ac. (16.58 sq. mi.) **SHAPE:** Roughly triangular, base 4.29 mi., length 5.66 mi.

**SLOPE:** 2% is in 0-3%; 41% in 3-8%; 31% in 8-15%; 17% in 15-25%; 9% in 25-35% and over. Aspect ESE.

**SOILS:** Medium acid to neutral glacial till derived from schist interbedded with limestone. 1 Cabot silt loam and very stony silt loam 33%; 2 Calais loam and very stony loam 18%; 3 Royalton loam and very stony loam 18%; 4 Glover rocky and very rocky loam 16%; 5 Woodstock rocky and very rocky fine sandy loam 7%; 6 Colrain fine sandy loam 4%; 7 Peacham silt loam and very stony silt loam 3%; 8 Miscellaneous soils 1%. Topsoil - 1 moderate medium blocky structure; 2 & 3 moderate weak granular; 4 weak fine granular; 5 & 6 weak granular structure; 7 moderate fine subangular blocky; permeability, 1 moderate, 2 rapid, 3 moderately rapid, 4, 5 & 6 rapid, 7 moderate, 1, 9 in. av.; 2 & 3, 8 in. av.; 4, 7 in. av.; 5 & 6, 8 in. av.; 7, 10 in. av. Subsoil - 1 moderate medium blocky structure; 2 & 3 weak medium subangular blocky; 4 weak fine subangular blocky; 5 & 6 weak granular; 7 structureless massive; permeability, 1, 2, 3 & 4 moderate; 5 & 6 rapid; 7 slow. Permeability and av. depth to substratum - 1, slow at 18 in.; 2, moderate at 27 in.; 3, slow at 27 in.; 4 & 5, zero at 24 in.; 6, rapid at 33 in.; 7, slow at 12 in. Internal drainage - 1, 2, 3 & 4 moderate; 5 & 6 rapid; 7 very slow.

**EROSION:** 1 - 99%; 2 - 1%.

**LAND CAPABILITY:** II - 16%; III - 0%; IV - 7%; V - 23%; VI - 42%; VII - 4%.

**SURFACE DRAINAGE:** Well defined - principal waterway 1.58 mi. long with average grade of 2.4%; then splits into two waterways, one 4.32 mi. long with an average grade of 5.1% and the other 4.60 mi. long with an average grade of 4.9%.

**CHARACTER OF FLOW:** Perennial, continuous.

**INSTRUMENTATION:** Runoff - artificial control, 16 in. broad crested concrete weir with 10:1 crest slope for a height of 4.5 ft., continuous waterstage recorder with strip chart speed of 9.6 in. per day; field rating curve established by current meter measurement; precipitation - 17 continuous recording gages, 12 with 24 hr. charts, 2 with 12 hr. charts, 2 with 192 hr. charts, and 1 tipping bucket gage, two standard gages. Nine snow courses taken weekly during the winter months.

**WATERED CONDITIONS:** Forest 64%; predominately hardwood, birch, beech, and maple with mixed pine, spruce, and fir softwoods; 15% pasture, consisting of bluegrass and other mixed small grasses; cultivated 17%, most of which is in hay (orchard grass and clover mixture), less than 1% of the watershed is in row crops at any one time, rotation is corn one year then hay for 5 to 10 years; idle land 3%, mostly in bushes and dense grass; home sites 1%, short lawn grasses and buildings.

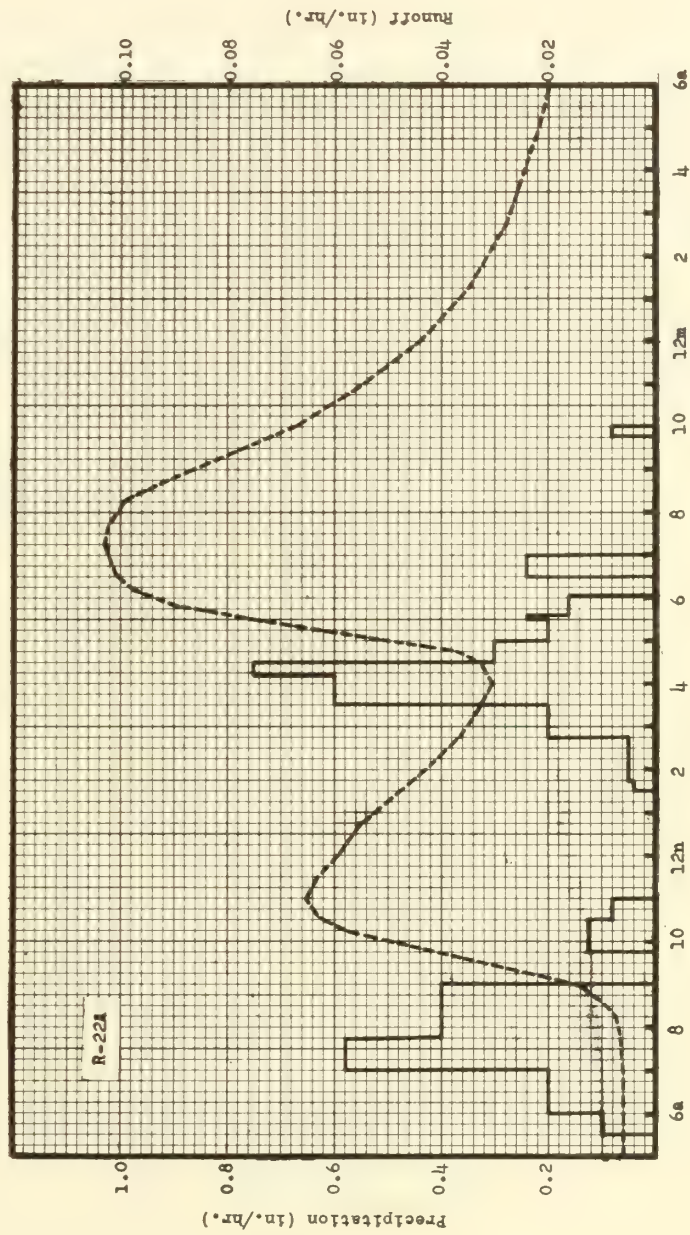
**GENERAL COMMENTS:** Sloping to steep cultivated and forested land at higher elevations in the New England and Eastern New York Upland resource area (R-144) with rapid to slowly permeable soils, rapid to moderate internal drainage, excellent surface drainage, and little or no erosion problems.

| MONTHLY PRECIPITATION AND RUNOFF (Inches)                                                                                                                                            |                   |              |                                           |              |              |              |              | North Danville, Vermont Watershed W-1 |              |              |              |              |                |      |        |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|-------------------------------------------|--------------|--------------|--------------|--------------|---------------------------------------|--------------|--------------|--------------|--------------|----------------|------|--------|------|
| Month<br>Year                                                                                                                                                                        | Jan.              | Feb.         | Mar.                                      | Apr.         | May          | June         | July         | Aug.                                  | Sept.        | Oct.         | Nov.         | Dec.         | Year           |      |        |      |
| 1958 P<br>A                                                                                                                                                                          |                   |              |                                           |              |              |              |              |                                       |              | 5.23<br>nr   | 2.70<br>1.23 | 1.89<br>nr   | 9.82<br>1.23   |      |        |      |
| 1959 P<br>A                                                                                                                                                                          | 1.01<br>1.50      | 2.51<br>1.38 | 4.01<br>1.20                              | 1.17<br>8.66 | 1.62<br>1.46 | 2.98<br>0.66 | 0.78<br>0.17 | 4.60<br>0.29                          | 1.54<br>0.27 | 9.02<br>3.24 | 5.57<br>4.03 | 3.80<br>3.40 | 41.61<br>26.26 |      |        |      |
| Normal P                                                                                                                                                                             | 2.53              | 2.17         | 2.51                                      | 2.87         | 3.30         | 3.86         | 3.52         | 3.35                                  | 3.53         | 2.87         | 3.14         | 2.59         | 36.24          |      |        |      |
| ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS                                                              |                   |              |                                           |              |              |              |              | North Danville, Vermont Watershed W-1 |              |              |              |              |                |      |        |      |
| YEAR                                                                                                                                                                                 | MAXIMUM DISCHARGE |              | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |              |              |              |              |                                       |              |              |              |              |                |      |        |      |
|                                                                                                                                                                                      |                   |              | 1 hour                                    |              | 2 hours      |              | 6 hours      |                                       | 12 hours     |              | 1 day        |              | 2 days         |      | 8 days |      |
|                                                                                                                                                                                      | Date              | Rate         | Date                                      | Vol.         | Date         | Vol.         | Date         | Vol.                                  | Date         | Vol.         | Date         | Vol.         | Date           | Vol. | Date   | Vol. |
| 1958                                                                                                                                                                                 | 10-24             | .02          | 10-24                                     | .02          | 10-24        | .06          | 10-24        | .11                                   | 10-24        | .21          | 10-24        | .27          | 10-24          | 0.40 | 10-30  | 1.11 |
| 1959                                                                                                                                                                                 | 10-24             | .10          | 10-24                                     | .10          | 10-24        | .20          | 10-24        | .50                                   | 10-24        | .77          | 10-24        | 1.03         | 10-25          | 1.50 | 4-10   | 3.25 |
| Notes: Normal P based on 60 yr. record (1894-1954) at St. Johnsbury, Vt. Quality of records:<br>P - excellent, A - November, 1958 through March, 1959 - fair, remainder - excellent. |                   |              |                                           |              |              |              |              |                                       |              |              |              |              |                |      |        |      |

Cooperative Research Project of the USDA, the Agricultural Experiment Station and the College of Technology, University of Vermont, and the Vermont State Water Conservation Board

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                 |                                    |                     |                              |                      |                  | North Danville, Vermont Watershed W-1 |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------|------------------------------|----------------------|------------------|---------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                  |                                    |                     | Rainfall                     |                      |                  | Runoff                                |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                   | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches)  | Date and<br>time             | Intensity<br>(in/hr) | Acc.<br>(inches) | Date and<br>time                      | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of October 24, 1959                                                                                                                                                                                                                                                                                                                              |                                    |                     |                              |                      |                  |                                       |                 |                  |
| 9-24                                                                                                                                                                                                                                                                                                                                                   | 0                                  | .0044               | 10-24-59                     | Raingage             | R-22A            | 10-24-59                              |                 |                  |
| 9-25                                                                                                                                                                                                                                                                                                                                                   | 0                                  | .0042               | 5:30a                        | 0                    | 0                | 5:30a                                 | .0060           | 0                |
| 9-26                                                                                                                                                                                                                                                                                                                                                   | 0                                  | .0040               | 6:00                         | .10                  | .05              | 7:00                                  | .0060           | .0090            |
| 9-27                                                                                                                                                                                                                                                                                                                                                   | 0                                  | .0040               | 7:00                         | .20                  | .25              | 7:45                                  | .0062           | .0135            |
| 9-28                                                                                                                                                                                                                                                                                                                                                   | .04                                | .0042               | 7:45                         | .58                  | .60              | 8:15                                  | .0075           | .0152            |
| 9-29                                                                                                                                                                                                                                                                                                                                                   | 0                                  | .0030               | 8:00                         | .40                  | .70              | 8:35                                  | .0097           | .0181            |
| 9-30                                                                                                                                                                                                                                                                                                                                                   | .16                                | .0044               | 9:00                         | .40                  | 1.10             | 8:55                                  | .0140           | .0221            |
| 10-1                                                                                                                                                                                                                                                                                                                                                   | .77                                | .0117               | 9:45                         | 0                    | 1.10             | 10:00                                 | .0495           | .0565            |
| 10-2                                                                                                                                                                                                                                                                                                                                                   | 0                                  | .0288               | 10:30                        | .13                  | 1.20             | 10:15                                 | .0578           | .0699            |
| 10-3                                                                                                                                                                                                                                                                                                                                                   | 0                                  | .0113               | 11:00                        | .08                  | 1.24             | 10:35                                 | .0629           | .0900            |
| 10-4                                                                                                                                                                                                                                                                                                                                                   | 0                                  | .0086               | 1:30p                        | 0                    | 1.24             | 11:00                                 | .0645           | .1166            |
| 10-5                                                                                                                                                                                                                                                                                                                                                   | .05                                | .0073               | 1:45                         | .04                  | 1.25             | 11:30                                 | .0629           | .1485            |
| 10-6                                                                                                                                                                                                                                                                                                                                                   | .70                                | .0380               | 2:45                         | .05                  | 1.30             | 12:00m                                | .0599           | .1792            |
| 10-7                                                                                                                                                                                                                                                                                                                                                   | 1.80                               | .2310               | 3:30                         | .20                  | 1.45             | 12:45p                                | .0542           | .2219            |
| 10-8                                                                                                                                                                                                                                                                                                                                                   | .10                                | .2311               | 4:10                         | .60                  | 1.85             | 2:00                                  | .0426           | .2825            |
| 10-9                                                                                                                                                                                                                                                                                                                                                   | .10                                | .0670               | 4:30                         | .75                  | 2.10             | 2:45                                  | .0365           | .3121            |
| 10-10                                                                                                                                                                                                                                                                                                                                                  | 0                                  | .0360               | 5:00                         | .30                  | 2.25             | 3:30                                  | .0326           | .3381            |
| 10-11                                                                                                                                                                                                                                                                                                                                                  | .14                                | .0280               | 5:30                         | .20                  | 2.35             | 4:00                                  | .0307           | .3539            |
| 10-12                                                                                                                                                                                                                                                                                                                                                  | .07                                | .0370               | 5:35                         | .24                  | 2.37             | 4:30                                  | .0326           | .3697            |
| 10-13                                                                                                                                                                                                                                                                                                                                                  | .03                                | .0213               | 6:05                         | .16                  | 2.45             | 4:45                                  | .0369           | .3784            |
| 10-14                                                                                                                                                                                                                                                                                                                                                  | 0                                  | .0197               | 6:30                         | 0                    | 2.45             | 5:30                                  | .0757           | .4206            |
| 10-15                                                                                                                                                                                                                                                                                                                                                  | 0                                  | .0166               | 7:00                         | .24                  | 2.57             | 5:50                                  | .0894           | .4482            |
| 10-16                                                                                                                                                                                                                                                                                                                                                  | 0                                  | .0139               | 9:45                         | 0                    | 2.57             | 6:10                                  | .0978           | .4794            |
| 10-17                                                                                                                                                                                                                                                                                                                                                  | .40                                | .0196               | 10:00                        | .08                  | 2.59             | 6:30                                  | .1007           | .5125            |
| 10-18                                                                                                                                                                                                                                                                                                                                                  | .10                                | .0581               |                              |                      |                  | 7:15                                  | .1029           | .5888            |
| 10-19                                                                                                                                                                                                                                                                                                                                                  | 0                                  | .0360               | Total Rainfall <sup>4/</sup> |                      |                  | 7:40                                  | .1021           | .6315            |
| 10-20                                                                                                                                                                                                                                                                                                                                                  | .07                                | .0276               |                              | R-1                  | 2.97             | 8:15                                  | .0992           | .6902            |
| 10-21                                                                                                                                                                                                                                                                                                                                                  | 0                                  | .0379               |                              | R-2                  | 2.58             | 8:45                                  | .0901           | .7376            |
| 10-22                                                                                                                                                                                                                                                                                                                                                  | 0                                  | .0284               |                              | R-12                 | 2.78             | 10:00                                 | .0673           | .8360            |
| 10-23                                                                                                                                                                                                                                                                                                                                                  | .78                                | .1391               |                              | R-16                 | 3.07             | 11:00                                 | .0542           | .8967            |
| 10-24                                                                                                                                                                                                                                                                                                                                                  | .02 <sup>2/</sup>                  | .0809 <sup>3/</sup> |                              | R-19                 | 3.03             | 12:00m                                | .0441           | .9459            |
| Watershed Conditions: All the leaves had fallen providing good forest floor cover, 64%; pastured land had average grass height of 4 inches, 15%; hay with one month growth after last cutting had an average height of 6 inches, 16%; idle land had heavy growth of high grasses and bushes, 3%; plowed land was open with no cover, 1%; homesites, 1% |                                    |                     | Thiessen weighted average    |                      |                  | 10-25-59                              |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                        |                                    |                     |                              |                      |                  | 1:15a                                 | .0351           | .9953            |
|                                                                                                                                                                                                                                                                                                                                                        |                                    |                     |                              |                      |                  | 2:45                                  | .0280           | 1.0427           |
|                                                                                                                                                                                                                                                                                                                                                        |                                    |                     |                              |                      |                  | 4:45                                  | .0224           | 1.0931           |
|                                                                                                                                                                                                                                                                                                                                                        |                                    |                     |                              |                      |                  | 7:00                                  | .0180           | 1.1386           |
|                                                                                                                                                                                                                                                                                                                                                        |                                    |                     |                              |                      |                  | 8:45                                  | .0153           | 1.1677           |
|                                                                                                                                                                                                                                                                                                                                                        |                                    |                     |                              |                      |                  | 10:00                                 | .0148           | 1.1865           |

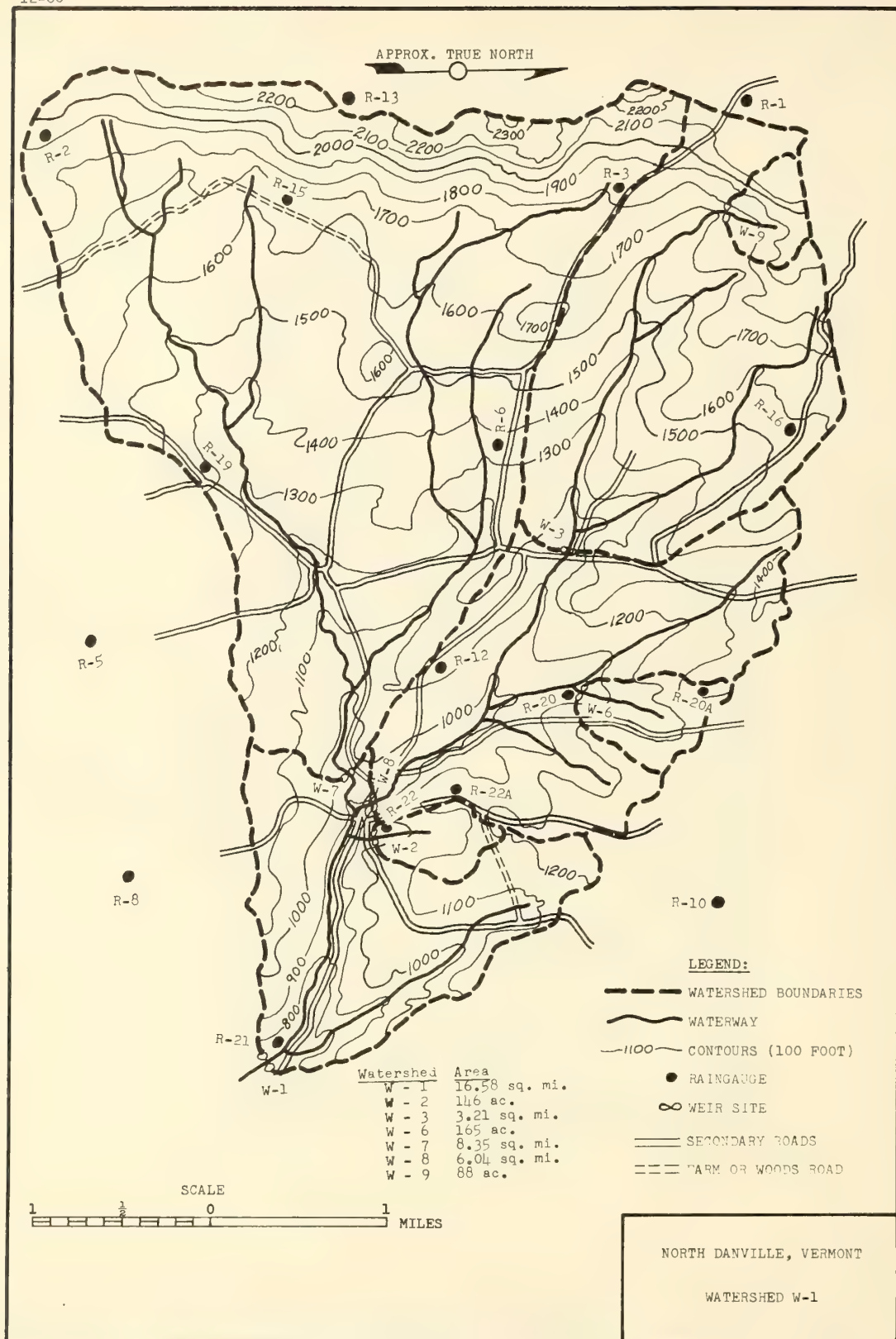
Notes: To convert runoff in in/hr to cfs multiply by 10,698.4. 1/ R-22A totals for date shown. 2/ Rainfall ended at 2:30a 10-24-59. 3/ Runoff prior to 5:30a. 4/ Only 6 raingages in operation at time of event.



October 24-25, 1959

NORTH DANVILLE, VERMONT WATERSHED W-1





## NORTH DANVILLE, VERMONT Watershed W-2

**LOCATION:** Caledonia Co., Vt.; 5 mi. NW of St. Johnsbury; unnamed tributary of Sleepers River, Connecticut River Basin.

**AREA:** 120 ac. **SHAPE:** roughly diamond, short diagonal 2800 ft. long diagonal 3600 ft.

**SLOPES:** 2% in 0-3%; 10% in 3-5%; 11% in 5-15%; 35% in 15-25%; 6% in 25-35% and over. Aspect S.

**SOILS:** Medium acid to neutral glacial till derived from schist interbedded with limestone. 1 Colrain fine sandy loam 30%; 2 Weststock rocky and very rocky fine sandy loam 20%; 3 Cabot silt loam and very stony silt loam 10%; 4 Royalton loam 12%; 5 Calais loam and very stony loam 10%; 6 Peacham silt loam and very stony silt loam 6%.  
**Topsoil** - 1 & 2 weak granular structure; 3 moderate medium blocky; 4 & 5 moderate medium granular; 6 moderate fine subangular blocky; permeability; 1 & 2 rapid; 3 moderate; 4 moderately rapid; 5 rapid; 6 moderate; 1 & 2, 6 in. av.; 3, 9 in. av.; 4 & 5, 8 in. av.; 6, 18 in. av. **Subsoil** - 1 & 2 weak granular structure; 3 moderate medium; 4 & 5 weak medium subangular blocky; 6 structureless massive; permeability; 1 & 2, rapid; 3, 4 & 5, moderate; 6, slow. Permeability and av. depth to substratum - 1, rapid at 33 in.; 2, zero at 24 in.; 3, slow at 18 in.; 4, slow at 27 in.; 5, moderate at 27 in.; 6, slow at 12 in. Internal drainage - 1 & 2, rapid; 3, 4 & 5, medium; 6, very slow.

**EROSION:** 1 - 100%

**LAND CAPABILITY:** II - 20%; III - 30%; IV - 10%; V - 20%; VI - 9%; VII - 5%.

**SURFACE DRAINAGE:** Well defined - principal waterway 3950 ft. long. Channel grade 5% for 2500 ft. then 10% for 1450 ft.

**CHARACTER OF FLOW:** Perennial, continuous.

**INSTRUMENTATION:** Runoff - artificial control, 16 in. broad-crested triangular concrete weir with 5:1 crest slope for a height of 3 ft., continuous waterstage recorder with strip chart speed of 9.6 in. per day; a field rating curve established by volumetric measurement; precipitation - two continuous recording gages, one with a 12 hour chart and one with a 24 hour chart; one snow course taken weekly during winter months.

**WATERSHED CONDITIONS:** Cultivated 37%, land last plowed in 1956, since that time it has been in permanent hay consisting of a mixture of orchard grass and clover; pasture 38%, permanent pasture of bluegrass and other small mixed grasses; forest 25%, virgin growth of predominately maple and beech trees.

**GENERAL REPRESENTS:** Sloping to steep cultivated and forested land at higher elevations in the New England and Eastern New York Upland resource area (R-144) with rapid to slowly permeable soils, rapid to moderate internal drainage, excellent surface drainage, and little or no erosion problems.

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

## North Danville, Vermont Watershed W-2

| Month    | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year  |
|----------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| Year     |      |      |      |      |      |      |      |      |       |      |      |      |       |
| 1958 P   |      |      |      |      |      |      |      |      | 2.74  | 4.22 | 2.41 | 1.63 | 11.00 |
| Q        |      |      |      |      |      |      |      |      | .97   | 1.05 | nr   |      | 2.02  |
| 1959 P   | 4.08 | 3.24 | 2.63 | 1.07 | 1.15 | 2.33 | .55  | 4.85 | 1.67  | 8.68 | 5.43 | 3.82 | 39.50 |
| Q        | nr   | nr   | nr   | nr   | 1.77 | .69  | .14  | .28  | .21   | .77  | 2.44 | 3.01 | 9.31  |
| Normal P | 2.53 | 2.17 | 2.51 | 2.87 | 3.30 | 3.86 | 3.52 | 3.35 | 3.53  | 2.87 | 3.14 | 2.59 | 36.24 |

## ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

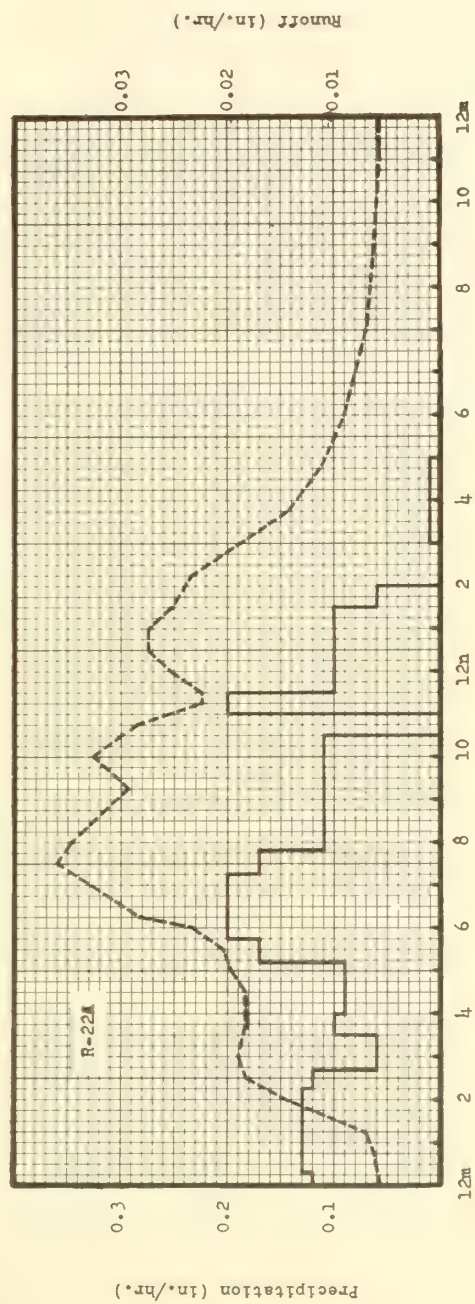
## North Danville, Vermont Watershed W-2

| YEAR | MAXIMUM DISCHARGE |      | MAXIMUM VOLUME FOR SELECTED TIME INTERVAL |      |         |      |         |      |          |      |       |      |        |      |        |      |
|------|-------------------|------|-------------------------------------------|------|---------|------|---------|------|----------|------|-------|------|--------|------|--------|------|
|      |                   |      | 1 hour                                    |      | 2 hours |      | 6 hours |      | 12 hours |      | 1 day |      | 2 days |      | 8 days |      |
|      | Date              | Rate | Date                                      | Vol. | Date    | Vol. | Date    | Vol. | Date     | Vol. | Date  | Vol. | Date   | Vol. | Date   | Vol. |
| 1958 | 10-23             | .01  | 10-23                                     | .01  | 10-23   | .02  | 10-23   | .05  | 10-23    | .08  | 10-23 | .08  | 10-23  | .13  | 10-23  | .42  |
| 1959 | 11-28             | .04  | 11-28                                     | .03  | 11-28   | .07  | 11-28   | .18  | 11-28    | .31  | 11-28 | .43  | 11-28  | .56  | 11-22  | 1.19 |

Notes: Normal P based on 60 yr. record (1894-1954) at St. Johnsbury, Vt. Quality of records:  
 P - excellent. Q - December, 1958 thru April, 1959 - none, remainder of year - excellent.

| SELECTED RUNOFF EVENTS                                                                                                                                                                                                                                                                                                                                       |                                    |                    |                  |                      |                     | North Danville, Vermont Watershed W-2 |                 |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------|------------------|----------------------|---------------------|---------------------------------------|-----------------|------------------|
| Antecedent conditions                                                                                                                                                                                                                                                                                                                                        |                                    |                    | Rainfall         |                      |                     | Runoff                                |                 |                  |
| Date                                                                                                                                                                                                                                                                                                                                                         | Rainfall <sup>1/</sup><br>(inches) | Runoff<br>(inches) | Date and<br>time | Intensity<br>(in/hr) | Acc.<br>(inches)    | Date and<br>time                      | Rate<br>(in/hr) | Acc.<br>(inches) |
| Event of November 28, 1959                                                                                                                                                                                                                                                                                                                                   |                                    |                    |                  |                      |                     |                                       |                 |                  |
| 10-28                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0360              | 11-27-59         | Raingage             | R-22A <sup>2/</sup> | 11-27-59                              |                 |                  |
| 10-29                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0360              | 12:00m           | 0                    | 0                   | 12:00m                                | .0057           | 0                |
| 10-30                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0336              | 11-28-59         |                      |                     | 11-28-59                              |                 |                  |
| 10-31                                                                                                                                                                                                                                                                                                                                                        | .41                                | .0631              | 12:20a           | .12                  | .04                 | 12:45a                                | .0061           | .0044            |
| 11-1                                                                                                                                                                                                                                                                                                                                                         | .18                                | .0633              | 1:30             | .13                  | .19                 | 1:15                                  | .0070           | .0077            |
| 11-2                                                                                                                                                                                                                                                                                                                                                         | .05                                | .0506              | 2:15             | .13                  | .29                 | 2:00                                  | .0145           | .0158            |
| 11-3                                                                                                                                                                                                                                                                                                                                                         | 0                                  | .0384              | 2:40             | .12                  | .34                 | 2:30                                  | .0182           | .0239            |
| 11-4                                                                                                                                                                                                                                                                                                                                                         | .05                                | .0384              | 3:30             | .06                  | .39                 | 3:00                                  | .0190           | .0332            |
| 11-5                                                                                                                                                                                                                                                                                                                                                         | .02                                | .0480              | 4:00             | .10                  | .44                 | 3:45                                  | .0182           | .0472            |
| 11-6                                                                                                                                                                                                                                                                                                                                                         | .49                                | .0810              | 5:10             | .09                  | .54                 | 4:15                                  | .0182           | .0563            |
| 11-7                                                                                                                                                                                                                                                                                                                                                         | 0                                  | .0582              | 5:45             | .17                  | .64                 | 5:00                                  | .0197           | .0705            |
| 11-8                                                                                                                                                                                                                                                                                                                                                         | 0                                  | .0480              | 7:15             | .20                  | .94                 | 5:30                                  | .0204           | .0805            |
| 11-9                                                                                                                                                                                                                                                                                                                                                         | 0                                  | .0480              | 7:50             | .17                  | 1.04                | 6:00                                  | .0232           | .0914            |
| 11-10                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0480              | 8:45             | .11                  | 1.14                | 6:15                                  | .0281           | .0978            |
| 11-11                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0480              | 10:30            | .11                  | 1.34                | 7:30                                  | .0360           | .1379            |
| 11-12                                                                                                                                                                                                                                                                                                                                                        | .06                                | .0564              | 11:00            | 0                    | 1.34                | 8:00                                  | .0346           | .1555            |
| 11-13                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0480              | 11:30            | .20                  | 1.44                | 9:15                                  | .0292           | .1954            |
| 11-14                                                                                                                                                                                                                                                                                                                                                        | .40                                | .0816              | 12:00n           | .10                  | 1.49                | 10:00                                 | .0326           | .2186            |
| 11-15                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0682              | 1:00             | .10                  | 1.59                | 10:45                                 | .0281           | .2444            |
| 11-16                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0552              | 1:30             | .10                  | 1.64                | 11:15                                 | .0224           | .2540            |
| 11-17                                                                                                                                                                                                                                                                                                                                                        | .35                                | .0832              | 2:00             | .06                  | 1.67                | 11:30                                 | .0224           | .2596            |
| 11-18                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0630              | 3:00             | 0                    | 1.67                | 12:00n                                | .0251           | .2715            |
| 11-19                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0552              | 4:00             | .01                  | 1.68                | 12:30p                                | .0272           | .2846            |
| 11-20                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0528              | 5:00             | .01                  | 1.69                | 1:00                                  | .0272           | .2982            |
| 11-21                                                                                                                                                                                                                                                                                                                                                        | .19                                | .0582              |                  |                      |                     | 1:30                                  | .0251           | .3112            |
| 11-22                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0648              |                  |                      |                     | 2:15                                  | .0232           | .3293            |
| 11-23                                                                                                                                                                                                                                                                                                                                                        | .02                                | .0693              |                  |                      |                     | 3:45                                  | .0145           | .3576            |
| 11-24                                                                                                                                                                                                                                                                                                                                                        | .50                                | .1091              |                  |                      |                     | 4:15                                  | .0112           | .3705            |
| 11-25                                                                                                                                                                                                                                                                                                                                                        | .71                                | .2125              |                  |                      |                     | 6:00                                  | .0090           | .3831            |
| 11-26                                                                                                                                                                                                                                                                                                                                                        | 0                                  | .0780              |                  |                      |                     | 8:00                                  | .0070           | .3991            |
| 11-27                                                                                                                                                                                                                                                                                                                                                        | .51 <sup>3/</sup>                  | .0972              |                  |                      |                     | 10:00                                 | .0061           | .4122            |
|                                                                                                                                                                                                                                                                                                                                                              |                                    |                    |                  |                      |                     | 12:00m                                | .0057           | .4240            |
|                                                                                                                                                                                                                                                                                                                                                              |                                    |                    |                  |                      |                     | 11-29-59                              |                 |                  |
|                                                                                                                                                                                                                                                                                                                                                              |                                    |                    |                  |                      |                     | 3:00a                                 | .0057           | .4411            |
| Watershed Conditions: Pastured land had average grass height of 4 inches, 38%; hay had made good growth after last cutting and was 6 to 10 inches high, 37%; forested area had excellent ground cover from fallen leaves, 25%. Frost depth was not observed, but estimated to be negligible due to good ground cover and warm temperature prior to rainfall. |                                    |                    |                  |                      |                     |                                       |                 |                  |

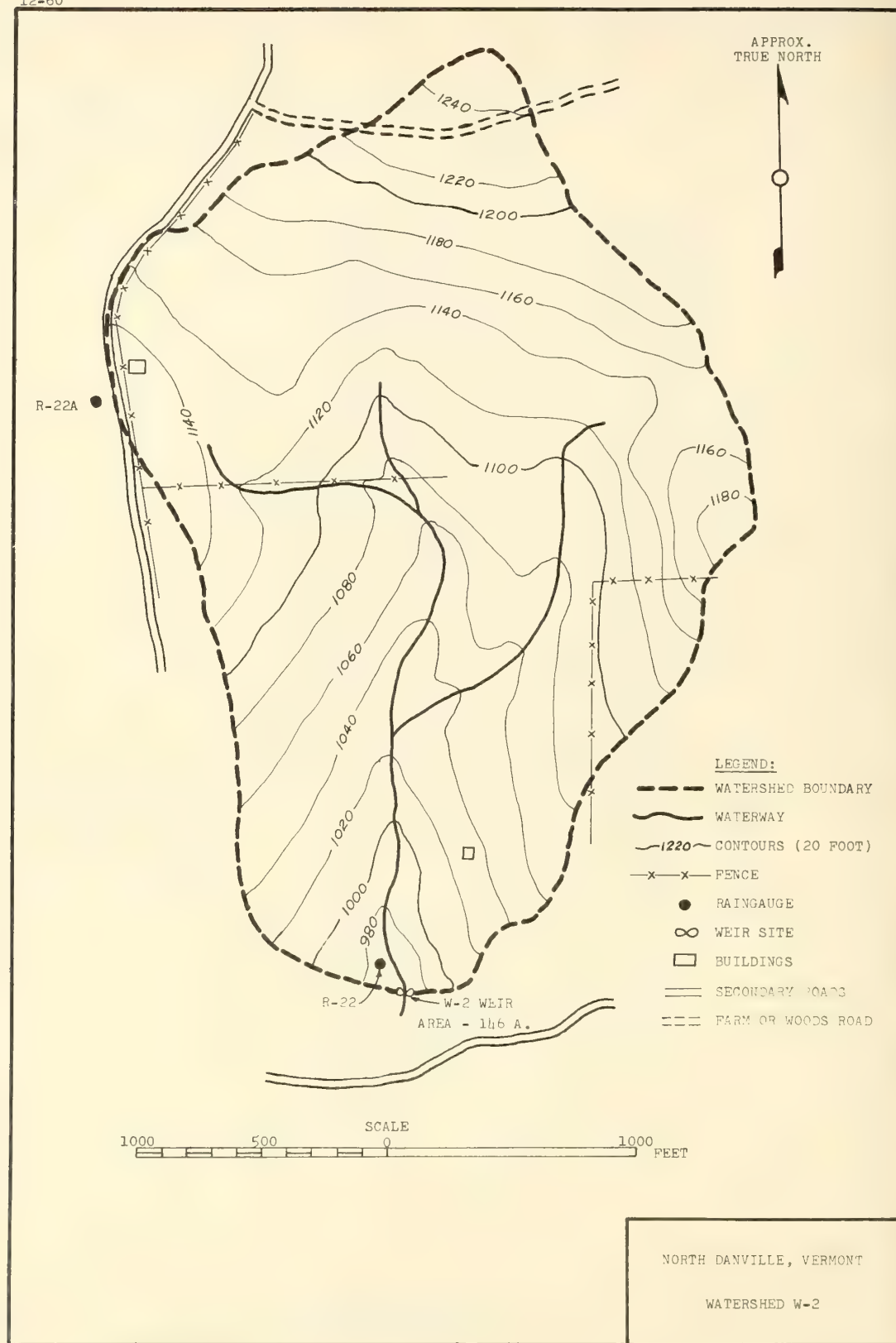
Notes: To convert runoff in in/hr to cfs multiply by 147.22. <sup>1/</sup> R-22A totals for date shown. <sup>2/</sup> Only raingage in operation at time of event. <sup>3/</sup> Rainfall ended at 7:00p 11-27-59.

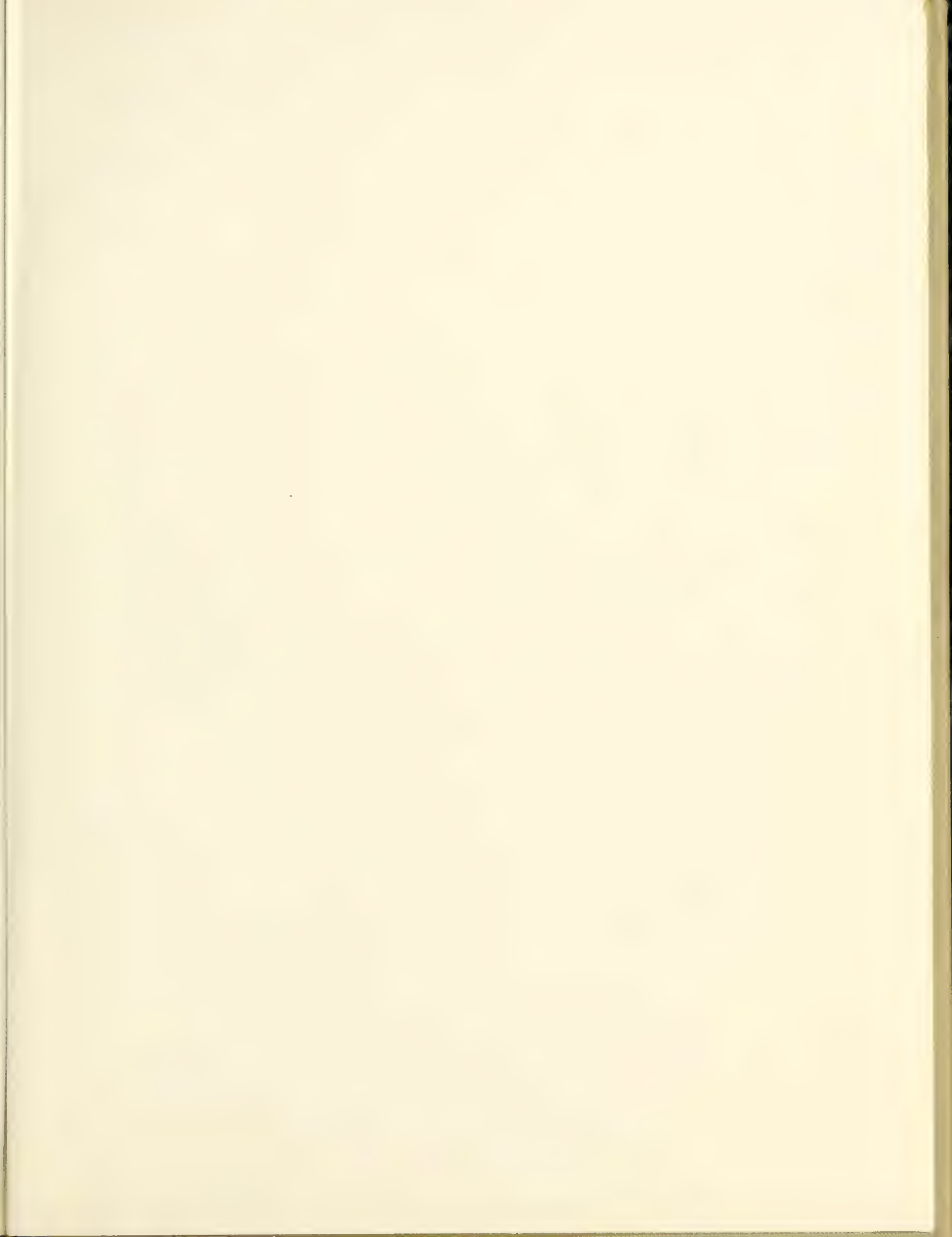


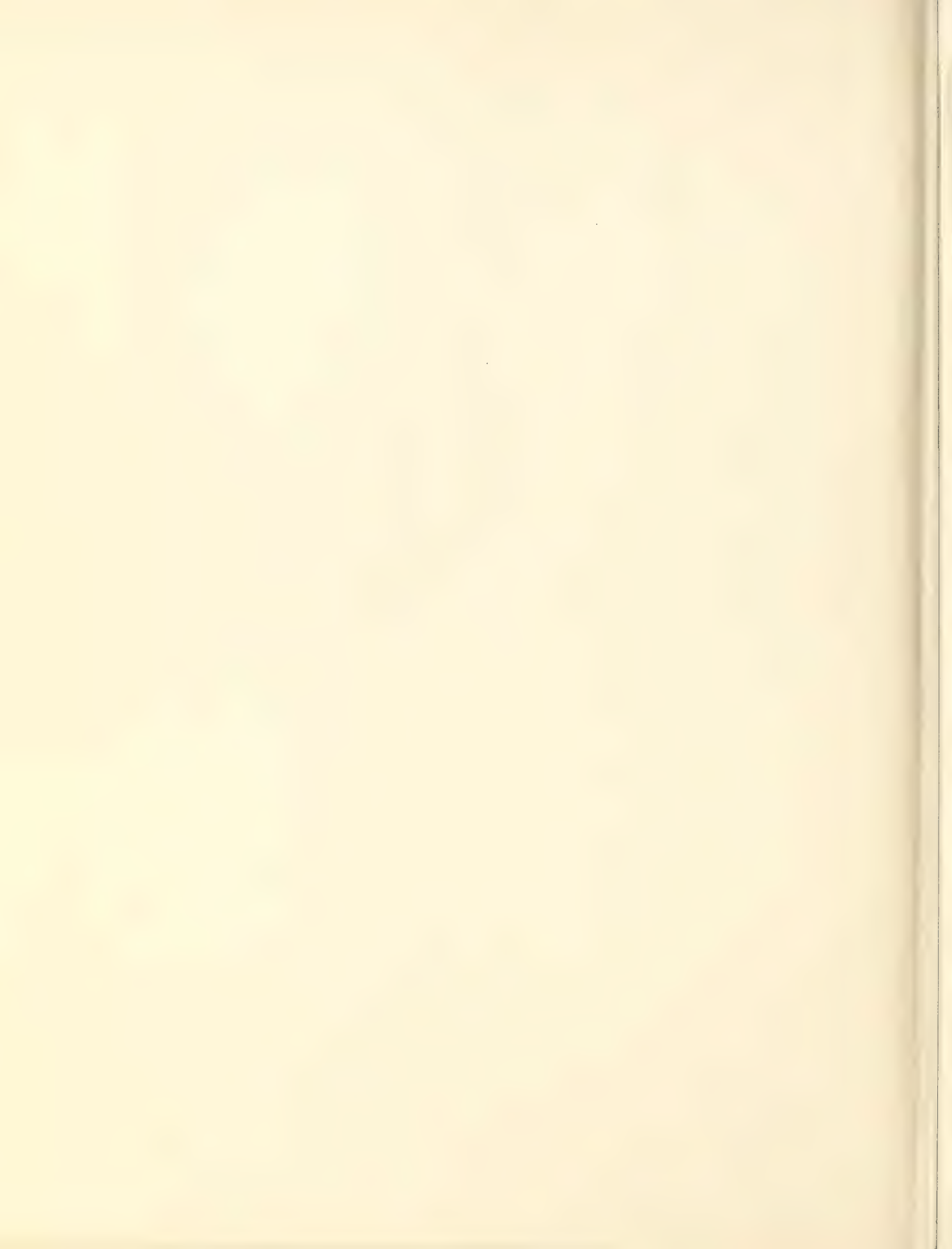
November 28, 1959

NORTH DANVILLE, VERMONT WATERSHED W-2

















# LOCATION OF EXPERIMENTAL AGRICULTURAL WATERSHEDS OF THE AGRICULTURAL RESEARCH SERVICE BY LAND RESOURCE REGIONS AND MAJOR LAND RESOURCE AREAS OF THE UNITED STATES (48 conterminous states)

## KEY TO RESEARCH LOCATIONS

- Current (continuing) studies  
○ Discontinued locations  
33

NOTE: Location 16 was not used



T Land Resource Region

59 Major Land Resource Area

Mountains

Wet Land

(continued)

- 134 Southern Mississippi Valley Silty Uplands  
135 Alabama and Mississippi Blackland Prairies  
136 Southern Piedmont  
137 Carolina and Georgia Sandhills  
138 North Central Florida Ridge

R NORTHEASTERN FORAGE AND FOREST REGION

- 139 Eastern Ohio Till Plain  
140 Glaciated Allegheny Plateau and Catskill Mountains  
141 Tug Hill Plateau  
142 St. Lawrence-Champlain Plain  
143 Northeastern Mountains  
144 New England and Eastern New York Upland  
145 Connecticut Valley  
146 Aroostook Area

S NORTHERN ATLANTIC SLOPE TRUCK, FRUIT, AND POULTRY REGION

- 147 Northern Appalachian Ridges and Valleys  
148 Northern Piedmont  
149 Northern Coastal Plain

T ATLANTIC AND GULF COAST LOWLANDS, FOREST AND TRUCK CROP REGION

- 150 Gulf Coast Prairies  
151 Gulf Coast Marsh  
152 Gulf Coast Flatwoods  
153 Atlantic Coast Flatwoods

U FLORIDA SUBTROPICAL FRUIT, TRUCK CROP AND RANGE REGION

- 154 South Central Florida Ridge  
155 Southern Florida Flatwoods  
156 Florida Everglades and Associated Areas

A NORTHWESTERN FOREST, FORAGE, AND SPECIALTY CROP REGION

- 1 Northern Pacific Coast Range and Valleys  
2 Willamette and Puget Sound Valleys  
3 Olympic and Western Slope Cascade Mountains  
4 California Coastal Redwood Belt  
5 Siskiyou-Trinity Area

B NORTHWESTERN WHEAT AND RANGE REGION

- 6 Eastern Slope Cascade Mountains  
7 Columbia Basin  
8 Columbia Plateau  
9 Palouse and Nez-Perce Prairies  
10 Upper Snake River Lava Plains and Hills  
11 Snake River Plains  
12 Lost River Valleys and Mountains  
13 Eastern Idaho Plateaus

C CALIFORNIA SUBTROPICAL FRUIT, TRUCK AND SPECIALTY CROP REGION

- 14 Central California Valleys  
15 Central California Coast Range  
16 California Delta  
17 Sacramento and San Joaquin Valleys  
18 Sierra Nevada Foothills  
19 Southern California Coastal Plain  
20 Southern California Mountains

D WESTERN RANGE AND IRRIGATED REGION

- 21 Klamath and Shasta Valleys and Basins  
22 Sierra Nevada Range  
23 Malheur High Plateau  
24 Humboldt Area  
25 Owyhee High Plateau  
26 Carson Basin and Mountains  
27 Fallon-Lovelock Area  
28 Great Salt Lake Area  
29 Southern Nevada Basin and Range

(continued)

- 30 Sonoran Basin and Range  
31 Imperial Valley  
32 Northern Intermountain Desertic Basins  
33 Semiarid Rocky Mountains  
34 Central Desertic Basins, Mountains and Plateaus  
35 Colorado and Green Rivers Plateaus  
36 New Mexico and Arizona Plateaus and Mesas  
37 San Juan River Valley Mesas and Plateaus  
38 Black, Hualapai, and Cerbat Mountains  
39 Arizona and New Mexico Mountains  
40 Central Arizona Basin and Range  
41 Southeastern Arizona Basin and Range  
42 Southern Desertic Basins, Ranges and Mountains

E ROCKY MOUNTAIN RANGE AND FOREST REGION

- 43 Northern Rocky Mountains  
44 Northern Rocky Mountain Valleys  
45 Alpine Meadows and Rockland  
46 Northern Rocky Mountain Foothills  
47 Wasatch and Uinta Mountains  
48 Southern Rocky Mountains  
49 Southern Rocky Mountain Foothills  
50 San Luis Valley  
51 High Intermountain Valleys

F NORTHERN GREAT PLAINS SPRING WHEAT REGION

- 52 Brown Glaciated Plain  
53 Dark Brown Glaciated Plain  
54 Rolling Soft Shale Plain  
55 Black Glaciated Plains  
56 Red River Valley of the North  
57 Western Minnesota Forest-Prairie Transition

G WESTERN GREAT PLAINS RANGE AND IRRIGATED REG.

- 58 Northern Rolling High Plains  
59 Northern Smooth High Plains  
60 Pierre Shale Plains and Badlands  
61 Black Hills Foothills  
62 Black Hills

(continued)

- 63 Rolling Pierre Shale Plains  
64 Mixed Sandy and Silty Tableland  
65 Nebraska Sand Hills  
66 Dakota-Nebraska Eroded Tableland  
67 Central High Plains  
68 Irrigated Upper Platte River Valley  
69 Upper Arkansas Valley Rolling Plains  
70 Pecos-Canadian Plains and Valleys

H CENTRAL GREAT PLAINS WINTER WHEAT AND RANGE REGION

- 71 Central Nebraska Loess Hills  
72 Central High Tableland  
73 Rolling Plains and Breaks  
74 Central Kansas Sandstone Hills  
75 Central Loess Plains  
76 Bluestem Hills  
77 Southern High Plains  
78 Central Rolling Red Plains  
79 Great Bend Sand Plains  
80 Central Rolling Red Prairies

I SOUTHWESTERN PLATEAUS AND PLAINS, RANGE AND COTTON REGION

- 81 Edwards Plateau  
82 Texas Central Basin  
83 Rio Grande Plain

J SOUTHWESTERN PRAIRIES, COTTON AND FORAGE REGION

- 84 Cross Timbers  
85 Grand Prairie  
86 Texas Blackland Prairie  
87 Texas Claypan Area

K NORTHERN LAKE STATES FOREST AND FORAGE REG.

- 88 Northern Minnesota Swamps and Lakes  
89 Minnesota Rockland Hills  
90 Central Wisconsin and Minnesota Thin Loess and Till  
91 Wisconsin and Minnesota Sandy Outwash  
92 Superior Lake Plain  
93 Northern Michigan and Wisconsin Stony, Sandy and Rocky Plains and Hills  
94 Northern Michigan Sandy Drift

L LAKE STATES FRUIT, TRUCK, AND DAIRY REGION

- 95 Southeastern Wisconsin Drift Plain  
96 Western Michigan Fruit Belt  
97 Southwestern Michigan Fruit and Truck Belt  
98 Southern Michigan Drift Plain  
99 Erie-Huron Lake Plain  
100 Erie Fruit and Truck Area  
101 Ontario-Mohawk Plain

M CENTRAL FEED GRAINS AND LIVESTOCK REGION

- 102 Loess, Till, and Sandy Prairies  
103 Central Iowa and Minnesota Till Prairies  
104 Eastern Iowa and Minnesota Till Prairies  
105 Northern Mississippi Valley Loess Hills  
106 Nebraska and Kansas Loess-Drift Hills  
107 Iowa and Missouri Deep Loess Hills  
108 Illinois and Iowa Deep Loess and Drift  
109 Iowa and Missouri Heavy Till Plain

N EAST AND CENTRAL GENERAL FARMING AND FOREST REGION

- 110 Northern Illinois and Indiana Heavy Till Plain  
111 Indiana and Ohio Till Plain  
112 Cherokee Prairies  
113 Central Claypan Areas  
114 Southern Illinois and Indiana Thin Loess and Till Plain  
115 Central Mississippi Valley Wooded Slopes  
116 (See M Above)  
117 Ozark Highland  
118 Boston Mountains  
119 Ouachita Mountains  
120 Kentucky and Indiana Sandstone and Shale Hills and Valleys  
121 Kentucky Bluegrass  
122 Highland Rim and Pennyroyal  
123 Nashville Basin  
124 Western Allegheny Plateau  
125 Cumberland Plateau and Mountains  
126 Central Allegheny Plateau  
127 Eastern Allegheny Plateau and Mountains  
128 Southern Appalachian Ridges and Valleys  
129 Sand Mountain  
130 Blue Ridge

O MISSISSIPPI DELTA COTTON AND FEED GRAINS REGION

- 131 Southern Mississippi Valley Alluvium  
132 Eastern Arkansas Prairies  
133 (See P below)

P SOUTH ATLANTIC AND GULF SLOPE CASH CROP, FOREST, AND LIVESTOCK REGION

- 86 (See J Above)  
133 Southern Coastal Plain





